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IN THIS ISSUE

The Most Gigantic
Colossal
June Frolic
in
C. N. G. A. History
June 7, Riviera
Country Club

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For Golf or Banquet reservations, see George L. Tyler, secretary, C. N. G. A., 510 West 6th St., Los Angeles

California Well Represented at API Mid-Year Meeting..... 4

Progress in Geodynamic Prospecting for Oil and Gas Fields..... 9

Development of Plastics and Synthetic Rubbers Associated with Petroleum Hydrocarbons.....20

Discussion of Boiler Feed Control Problems and Their Solutions.....24

Laugh This Off.....29

Los Angeles Basin Development 30

San Joaquin Valley Development.....33

Coastal District Development.....36

Business Directory.....40

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May 21, 1941

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1,531,173	1,659,994	1,773,517	1,940,390	2,000,802	2,052,282	2,085,299	2,166,431
1,555,818	1,659,995	1,780,343	1,940,391	2,015,260	2,052,283	2,086,215	2,166,432
1,570,987	1,659,996	1,780,344	1,940,392	2,023,976	2,052,284	2,086,216	2,166,433
1,590,617	1,659,997	1,780,345	1,940,393	2,023,979	2,058,568	2,086,217	2,166,434
1,595,455	1,659,998	1,802,090	1,940,394	2,023,980	2,058,569	2,089,035	2,167,346
1,595,456	1,659,999	1,812,393	1,940,395	2,023,981	2,058,570	2,104,793	2,167,347
1,595,457	1,660,000	1,829,205	1,940,396	2,023,982	2,072,085	2,104,794	2,167,348
1,596,585	1,660,001	1,834,940	1,940,397	2,023,993	2,076,623	2,104,795	2,167,349
1,596,586	1,660,002	1,837,130	1,940,398	2,023,994	2,076,624	2,106,239	2,171,328
1,596,587	1,660,003	1,842,934	1,943,815	2,023,995	2,077,229	2,106,240	2,176,702
1,596,588	1,660,004	1,858,186	1,944,021	2,023,996	2,077,230	2,106,241	2,176,703
1,596,589	1,660,005	1,863,143	1,954,585	2,023,997	2,077,745	2,106,242	2,176,704
1,596,590	1,710,159	1,872,286	1,961,963	2,025,804	2,077,746	2,106,243	2,183,487
1,596,591	1,727,164	1,872,333	1,975,839	2,025,805	2,078,652	2,106,244	2,192,993
1,596,592	1,727,165	1,873,165	1,976,602	2,026,195	2,078,653	2,108,960	2,192,994
1,596,593	1,747,119	1,882,444	1,977,048	2,026,217	2,078,654	2,108,961	2,192,995
1,596,594	1,747,987	1,890,789	1,977,089	2,026,218	2,078,655	2,110,837	2,225,824
1,596,595	1,758,802	1,890,849	1,977,146	2,026,219	2,079,762	2,110,846	2,226,118
1,596,596	1,766,057	1,897,019	1,978,227	2,034,941	2,079,763	2,110,847	2,226,120
1,596,597	1,766,058	1,897,021	1,979,347	2,034,963	2,079,764	2,110,848	2,226,121
1,596,598	1,766,059	1,897,574	1,984,633	2,037,885	2,081,003	2,110,849	2,226,122
1,597,700	1,766,060	1,897,575	1,985,692	2,037,886	2,081,004	2,114,651	2,226,123
1,606,698	1,766,061	1,902,129	1,985,720	2,050,923	2,081,005	2,122,976	2,231,752
1,617,737	1,766,062	1,908,129	1,988,832	2,050,924	2,083,220	2,126,368	2,231,753
1,617,738	1,766,063	1,908,130	1,988,833	2,050,925	2,083,221	2,127,905	2,231,754
1,617,739	1,766,064	1,910,680	1,988,834	2,050,926	2,083,222	2,153,744	2,231,755
1,639,325	1,766,065	1,913,538	1,988,835	2,050,927	2,083,223	2,153,745	2,231,756
1,641,804	1,766,066	1,926,715	1,990,293	2,050,928	2,083,224	2,153,746	2,231,757
1,656,622	1,766,067	1,929,399	1,994,758	2,050,929	2,083,225	2,154,422	2,231,758
1,656,623	1,766,112	1,938,322	2,000,717	2,050,930	2,085,298	2,154,423	2,231,759
1,659,993	1,771,096	1,938,323	2,000,725	2,052,281			

Chemical demulsifying agents for use in practicing the aforesaid patented inventions are manufactured and sold by Petrolite Corporation, Ltd. under the trade names "Tret-O-litE" and "Dehydro".

Pursuant to the opinion of the United States Circuit Court of Appeals for the Ninth Circuit in Dehydrators, Ltd. et al. v. Petrolite Corporation, Ltd., 117 Fed. (2d) 183, Petrolite Corporation, Ltd. has fixed a royalty fee for the use of any or all of the aforesaid patented inventions at 20c per gallon ($10.00 per 50-gallon drum) of chemical demulsifying agent employed, whether obtained from Petrolite Corporation, Ltd., or from any other source.

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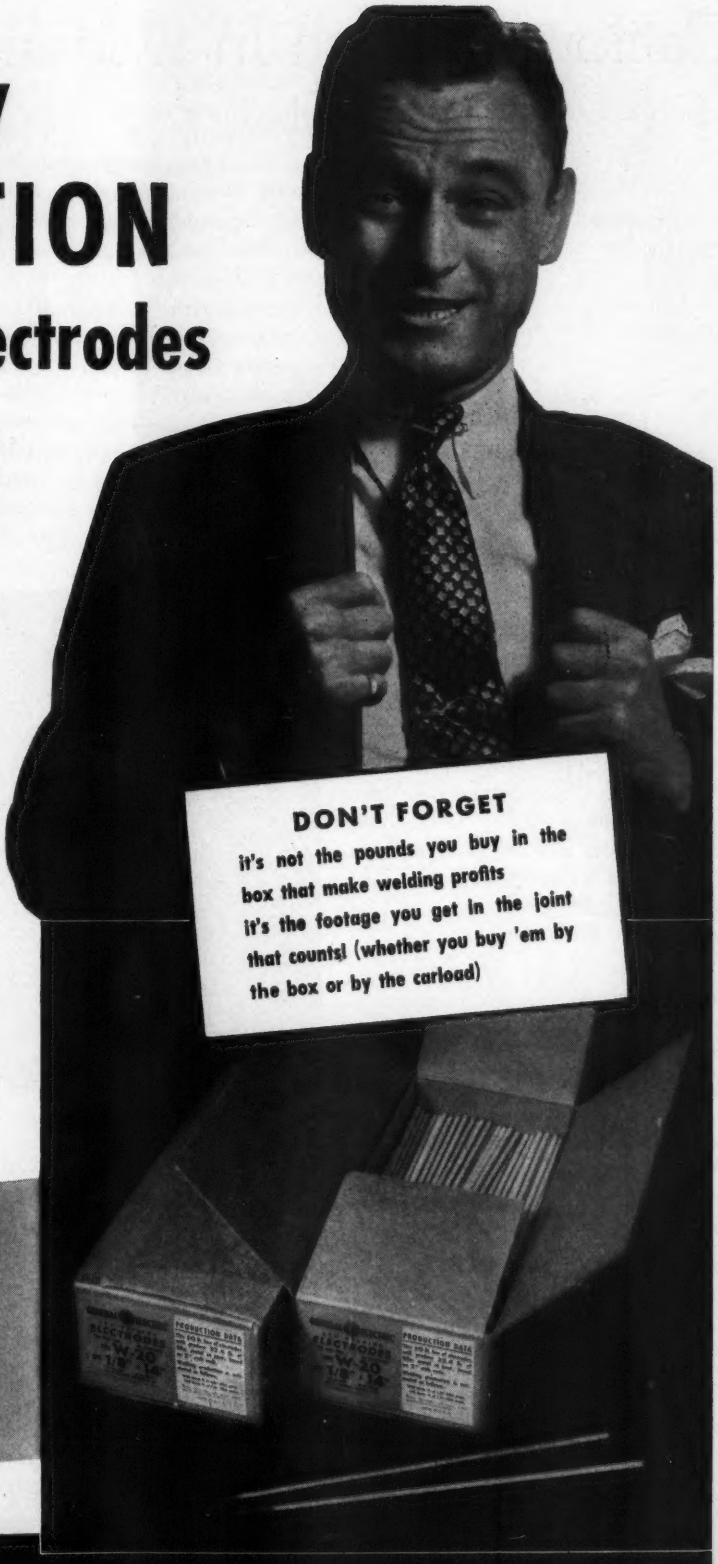
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GENERAL ELECTRIC

California Much In Evidence at A. P. I.

Midyear Meeting in Tulsa

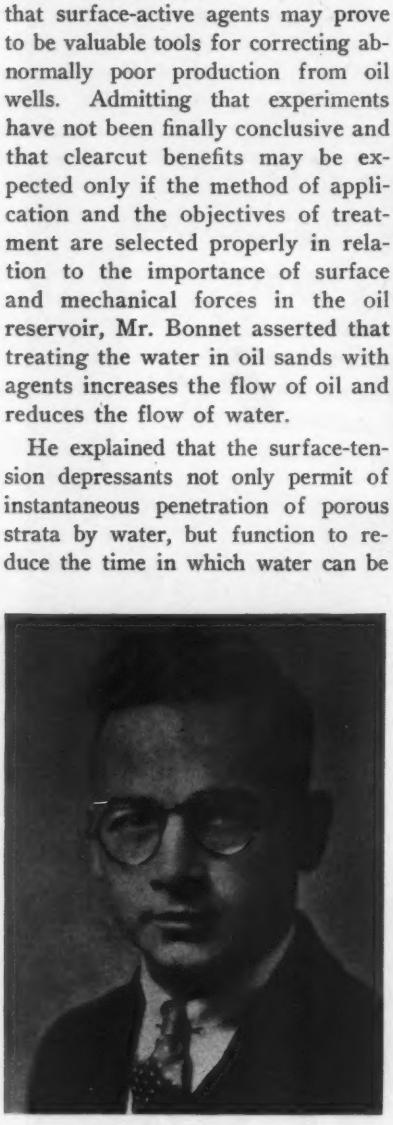
Use of surface-active, or wetting, agents to expedite and to increase the flow of oil from oil sands by reducing surface tension of water was recommended to the Division of Production group session at the American Petroleum Institute's 11th Mid-Year meeting at Tulsa, May 22.

The recommendation came from C. F. Bonnet, of American Cyanamid and Chemical Corp., Azusa, Calif., who said experiments have indicated that surface-active agents may prove to be valuable tools for correcting abnormally poor production from oil wells. Admitting that experiments have not been finally conclusive and that clearcut benefits may be expected only if the method of application and the objectives of treatment are selected properly in relation to the importance of surface and mechanical forces in the oil reservoir, Mr. Bonnet asserted that treating the water in oil sands with agents increases the flow of oil and reduces the flow of water.

He explained that the surface-tension depressants not only permit of instantaneous penetration of porous strata by water, but function to reduce the time in which water can be expelled by pressure applied to the porous strata. He said that it might become possible in the future to utilize the surface-active agents in connection with pressure water drive.

Surface-active compounds primarily effective for aiding penetration, he reported, are synthetic organic chemicals, the esters of sulfosuccinic acid, from which more than 1,500,000 compounds can be made in types suited for use under many different conditions.

Factors affecting the use of gravel in oil wells were discussed by Kenneth E. Hill, of the College of Mining, University of California, Berkeley, Calif. He said that results of preliminary experiments indicate that production rates are higher in gravel-packed than in conventionally-completed offset wells, and cumulative production is greater. Mr. Hill explained that the gravel appears to curtail the amount of sand migrating into the well bore, and increases production by enlarging the effective well diameter.



J. E. Sherborne

Malcolm W. Morris

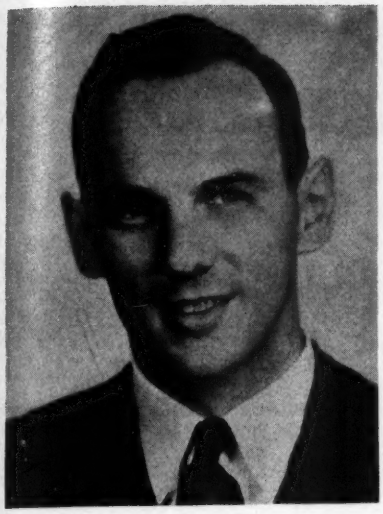
"The largest grains of a gravel to be used for screening unconsolidated sand," Mr. Hill reported, "should bear a diameter ratio of eight to the diameter of the sand at the 10 per-centile cumulative screen analysis. The major increases in production due to gravel packing may be obtained with increases in permeability of the gravel over the formation sand of 20 and with thickness of 12 inches. The improved production record of gravel-packed and prepacked wells as compared with conventional wells is probably largely due to the possibility of producing them at a larger percentage of their potential capacity."

Norris Johnston

Production engineers revealed some of the problems encountered in obtaining samples of strata from the lower depths and of keeping them in original state while putting them to various laboratory tests and analyses.

Three important problems to be solved in successful core analysis were outlined by Norris Johnston, of General Petroleum Corp., Los Angeles, who reported the difficulty of reconstruction of formation fluid content from the core-saturation data, the distinction between oil and wet sands, and the calculation of well potential from permeability.

More reliable studies than previously were possible now can be made from cores obtained by the use of the Carter pressure core barrel, it was said by J. J. Mullane, of The Carter Oil Co., Tulsa. The apparatus is sealed by valves, he explained, and the core and contents can be brought



C. F. Bonnet

to the surface under pressure approximately equal to the hydro-static head of the drilling mud at the coring depth. He declared this development makes possible the measurement not only of the amounts of residual liquids, but the gas released and the oil and water produced from the core under the influence of expanding gas.

Mr. Johnston explained that the scope of core analysis includes measuring sands for porosity, or the amount of space available for oil and gas; for permeability, or how rapidly oil and gas can flow through sands; and for saturation, or fluid content. He expressed the belief that the use of pressure core barrels does not solve all the problems because it is impossible to prevent contamination by drilling mud, and advocated oil coring, with reasonable assumptions, as the best method of obtaining a sample of reservoir rock. However, he said that use of a pressure core barrel with oil might afford the best answer of all.

Mr. Mullane insisted that use of the pressure core barrel provides reliable gas-oil ratio data, which can be considered as indications whether the formation cored is "alive" or contains oil under low pressure, or dead. He added that the pressure core barrel successfully can core gas reservoirs, and also retains the major proportion of hydrocarbon content of the core, which he said is lost in conventional coring.

"With the pressure core barrel," he explained, "it is possible to obtain an overall index of the properties of a well through the medium of the gas data and volume of oil produced from the core when the pressure in the barrel is relieved. The detailed sample analysis then can be used as auxiliary data to aid in making a good estimate of the properties of the formation."

Laboratory methods of measuring the permeability of porous media to liquids and gases were described by L. J. Klinkenberg, of Shell Development Co., Emeryville, Calif.

L. J. Klinkenberg

A new and accurate method of measuring the potential productiveness of oil wells—an alternative to open-flow tests and with decreased physical hazards — was described. Well potentials for use as the primary factor in allocations under the California "uniform method" already are being established successfully by depth-pressure means in flowing, gas-lift, and pumping wells, it was reported.

The method was described by Richard W. French, Continental Oil Co., Los Angeles; Malcolm W. Morris, Standard Oil Co. of California, Los Angeles; Everett G. Trostel, Union Oil Co. of California, Santa Fe Springs, Calif.; and John C. Young, of the office of Oil Administrator, Conservation Committee of California Oil Producers, Los Angeles. All are members of a group of engineers known as the Depth-Pressure Advisory Committee which advises the California Oil Administrator.

Kenneth E. Hill

The method of applying sub-surface pressures to potential determination was said to be based upon the measurement of producing pressures in the well bore opposite the producing horizon, together with corresponding rates of production. Correlation of these data permit of resolving a calculated potential for specified minimum sub-surface producing pressure. It was reported that the method benefits the statewide proration system in the way of improved accuracy, more

John C. Young

equitable relative well ratings, and decreased physical hazards to wells and reservoirs. Operators were said to benefit by avoiding the overproduction and possible damage to the well which might result from open-production tests, as well as dangers of water incursion and sand entry.

Measurement of well-performance characteristics was said to be as helpful to the operator as to the administration of proration, and further aid was seen in the possibility of using production equipment properly adapted to the well. Costs of well measurement were estimated to run from $75 to $225 for flowing and gas-lift wells, and to average $150 on 5,000-foot pumping wells.

A paper on mud flow in drilling was presented by R. J. S. Pigott, of Gulf Research and Development Co., Pittsburgh, Pa. He said that tests inaugurated 10 years ago have demonstrated that pressure drop and the sustaining effect of any mud can be computed once complete viscosity-velocity relations and mud density have been determined.

Boucke Made V. President Tide Water Associated

At the organization meeting of directors of Tide Water Associated Oil Company, following the annual meeting of stockholders at the company's offices, 17 Battery Place, May 1, U. B. Boucke, controller of the company, was elected a vice-president. Other officers were re-elected as follows: president William F. Humphrey; vice-presidents, C. R. Barton, L. F. Bayer, J. D. Collins, L. C. Decius, B. I. Graves, K. R. Hankinson, George J. Hanks, L. D. Jurs, R. B. Pringle, and Edward H. Salrin; controller, U. B. Boucke; secretary, William J. Burker; treasurer, K. R. Hankinson; executive secretary, J. P. Edwards.

Quinine Substitute Found in California Oil

The oil wells of California may supplant the Cinchona trees of Java as the source of medicine for the 1,000,000 malaria suffers in the continental United States, a research chemist told the Virginia Academy of Science at Richmond, Virginia, on May 2. The chemist stated that experiments are well advanced with compounds, whose base is obtained from petroleum, which give promise of having more effectiveness than the universally used specific, quinine, or the synthetic coal tar derivatives, plasmochin and atropin. Petroleum from California has a chemical structure best adapted to the research on quinine.

API APPOINTS FACT-FINDING COMMITTEE FOR EAST COAST OIL SUPPLY PROBLEMS

A serious problem concerning the adequacy of future supplies of petroleum products for the heavy consuming areas of the East Coast, because of the diversion of 25 tankships to British service and the probable diversion of other tankships, led May 16 to the appointment of a fact-finding committee of oil men by the American Petroleum Institute at the request of the Office of Production Management. Excessive tankship diversion could seriously cripple the normal transportation movement of petroleum to the East Coast because more than 95 per cent of all the petroleum used along the Atlantic seaboard reaches it by tankship.

The Fact Finding Committee, appointed by W. R. Boyd, Jr., Institute executive vice president, has been asked by the OPM to make promptly an inventory of all available transportation facilities to the East Coast, the extent to which they now are being used, and what can be done to increase the facilities and their use. It is expected that by laying a full picture of the situation before the industry, individual companies will be encouraged to take prompt action to help meet it and avert a possible shortage of supplies caused, not only by inadequacy of supply but by a transportation bottleneck.

The committee also is asked to explore, with representatives of OPM, the question of whether the situation requires co-operative action by the industry, so that OPM may determine whether or not a formal petroleum industry committee should be formed.

Oil men who have been asked to become members of the committee, first meeting if which was called for May 23 in New York, are: John A. Brown, Socony-Vacuum Oil Co., Inc., New York; Robert H. Colley, Atlantic Refining Co., Philadelphia; **H. D. Collier, Standard Oil Co. of California, San Francisco;** W. S. Farish, Standard Oil Co. of New Jersey, New York; W. A. Jones, Cities Service Oil Co., New York; J. Frank Drake, Gulf Oil Corp., Pittsburgh; J. Howard Pew, Sun Oil Co., Philadelphia; Frank Phillips, Phillips Petroleum Co., Bartlesville, Okla.; W. S. S. Rodgers, The Texas Co., New York; **Reese H. Taylor, Union Oil Co. of California, Los Angeles;** R. van der Woude, Shell Union Oil Corp., New York; and E. G. Seubert, Standard Oil Co. (Indiana), Chicago.

Frank Buttram, Independent Petroleum Assn.; J. C. Hunter, Mid-Continent Oil and Gas Assn.; N. H. Weber, National Petroleum Assn.; C. L. Henderson, Western Petroleum Refiners Assn.; George Reid, Gulf Coast Refiners Assn.; **Roy Collum, California Oil & Gas Assn.; Lawrence Van der Leck, Oil Producers Agency of California;** Parker Melvin, Pennsylvania Grade Crude Oil Assn.; Ray Miller, Natural Gasoline Assn. of America; and Charles P. McGaha, National Stripper Well Assn.

Western Gulf Finds Deep Modelo Horizon

Biggest news from the Castaic region is the discovery of a new potentially productive horizon deep in the Modelo at Oak Canyon by Western Gulf Oil Co.'s Lechler No. 2. Drilled north and east of No. 1, which discovered small shallow production, the second well found the upper zone barren and was carried down as a deep prospect hole. At 6200 ft. abandonment was seriously considered but drilling was resumed after a few hours shut-down. A hard, tight, fine grained sand was topped at 6435 ft. and at 6466 ft. an attempt was made to test the formation through the drill pipe but mechanical trouble developed voiding the effort. Deepened to 6569 ft., a test was made with packer set at 6485 ft. which recovered 12 bbls. of 22 gravity oil and one bbl. of mud in 30 minutes. The gas blow was described as light, indicating only a pumper could be expected at this point. Deepening is in progress below 6900 ft. in shale topped at 6570 ft.

Barnsdall Drills 2nd Honor Ro. Well

Attention is now focused on Barnsdall Oil Co.'s current effort to find new Castaic area fields, Honor Ro. No. A-19-1 which is drilling at approximately 1500 ft. No. A-17-1, now suspended at 4717 ft., found much oil sand of poor quality in the Pliocene but was in a fault zone for most of its depth. It is believed that the second well is far enough away from the fault to have a chance at production in the Pico, but the main objective remains the Modelo which was never reached in the first.

A new ship propeller, recently invented, automatically changes its pitch and "bite" according to conditions just as motorists shift gears when motor vehicles strike a steep grade. Inventors claim that the adjustable mechanism will propel vessels almost at the same rate of speed in gales as in calm, breezeless seas.

Progress in Geodynamic Prospecting

For Oil and Gas Fields

API Spring Meet
Eastern District

By Sylvain J. Pirson
Petroleum Geologist, Geophysicist and Engineer
State College, Pa.

Summary: A new method of prospect for oil and gas fields is proposed whe by the rate of leakage of hydrocarl gases and vapors through the surface the ground is measured. Results of s veys can be expressed by various u such as in cubic feet of gases per sq mile per year, rate of pressure build or molecules of gas per unit area. Resu of leakage measurements over the Mus Mountain field of Northern Pennsylvania are presented.

It is a well known fact that oil and gas seepages are positive and direct signs of the existence of petroleum reservoirs at depth. In the early days of the petroleum industry, many oil and gas fields have been discovered by drilling for the buried reservoir at or near the occurrence of such leakage. Yet, these seepages were megascopic or visible without the aid of instruments to magnify the degree of sensitivity of our ordinary means of perception. If the seepages were abundant they could be seen spreading on the ground or the odor of gases could be perceived through the nasal sense, or better yet, the gas could be seen bubbling through stagnant waters and it would burn when lighted. Other phenomena related to seepage of gas were available to the oil prospector such as the observation of "sour dirt" particularly along the Gulf Coast. Presently, the possibilities of megascopic manifestations of oil and gas seepages from oil and gas reservoirs beneath the surface have practically all been exhausted from the point of view of finding new oil and gas reserves. New methods of gas detection by which, so to speak, our senses of smell or of sight have been greatly magnified, have been used for two decades already in looking for new oil and gas fields. Yet, it is only during the last five years that microscopic gas detection methods have received considerable attention in this country. At first, air from the soil was removed by suction and analyzed quantitatively for traces of hydrocarbon gases. This proved, however, to be a rather inconvenient field procedure and it was abandoned in favor of securing samples of soil taken at depths varying from a few inches to a few feet and subsequently analyzing the samples for traces of hydrocarbons. This is now commonly known as the "soil analysis" method. The standard pattern of soil hydrocarbon distribution which is expected in order to determine the existence of an oil or gas field is commonly known as the "halo" or "aureole". The assumption is that the limits of the fields coincide to a high degree with the halo. That the soil hydrocarbon halo exists above an oil field is an undeniable experimental fact often observed during the past three years by the writer himself. Unfortunately, many halos exist both when there is no geologic structure as well as when there is a structure devoid of the occurrence of gas or oil. This is now a well known fact in the oil circles and the writer knows of several instances where dry holes were drilled on seemingly good soil analysis halos. The protagonists of soil analysis counter by saying that their method is a structure detecting device thereby abandoning any claims to their use of a direct oil field finding method. The writer has no data on the percentage of success of soil analysis as a geologic structure finding method but it is known that certain consulting services advertise a percentage of success as high as 70 to 85%. This, however, includes among the statistics on which this claim is based the consideration that the method is successful when a well predicted as a dry hole comes in dry as well as when a predicted producer is drilled in

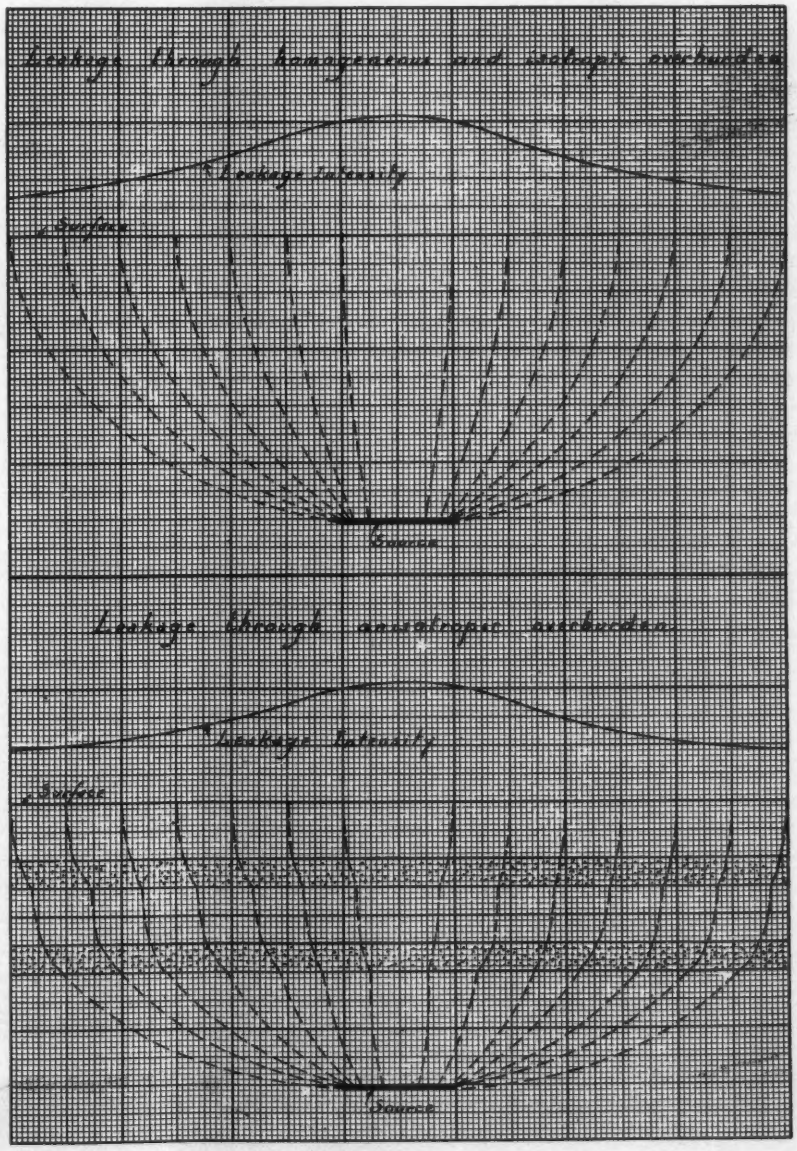


FIG. 1

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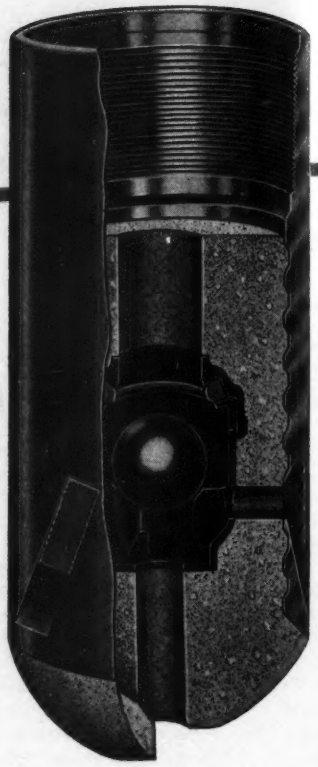

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Product No. 102
Baker Cement Wash-Down Whirler Float Shoe
Product No. 120
Baker Cement Wash-Down Whirler Guide Shoe
Product No. 121
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as a producing well. This, however, is fallacious information for the oil profession since in general one can estimate the chances of a wildcat well becoming a producer, when drilled at random, to be one in twenty-five. Therefore, if one predicts that all wildcat wells will be dry, he runs the chance of being 96% right and with a little judicious geological information about trends, and by refraining from making predictions in doubtful cases, he could increase his batting average to close to 100% without the help of much scientific information. Therefore, the claim of 100% success in predicting dry holes is absolutely meaningless as a measure of the degree of accuracy of any prospecting methods. The writer has shown, on the other hand, that a claim of 70% overall success for producer as well as for dry hole predictions is equivalent to an admission for soil analysis of three failures in four producer predictions in cases where no other geophysical means contributed to the discovery. On the other hand, the ratio of failures to the total number of trials would be 24/25 if geology, seismology and gravimetry contributed also to the discovery.

In the writer's opinion, the reason for the high degree of failure for soil analysis prospecting resides in the fact that the halo is a characteristic of the soil rather than an indication of a high rate of gas leakage. The writer has made measurements of various physical and chemical properties of soils concomitant with the measurement of its hydrocarbon content and obtained some rather startling correlations which tend to show that the halo is associated with high adsorbability of the soil. This adsorbability is produced by various causes among which may be listed: soil water circulation, erosion, floods, fertilization, orogeny, type of rocks, humic acid content, etc. Since at one time or another, during the genesis and migration of oil and gas, leakage took place almost any place, hydrocarbon gases became adsorbed in the soil and remained so although the oil below might have migrated far away. Adsorption is a reversible phenomenon to be sure, yet it takes high temperature and the application of vacuum in order to completely de-gas a sample of soil. Therefore the soil, once imbibed at equilibrium hydrocarbon concentration of the soil air, remains so imbibed indefinitely. This has been called the phenomenon of **persistence of the halo,** since in a structure depleted long ago by drainage, apparent leakage or production will still be indicated by a soil sample halo.

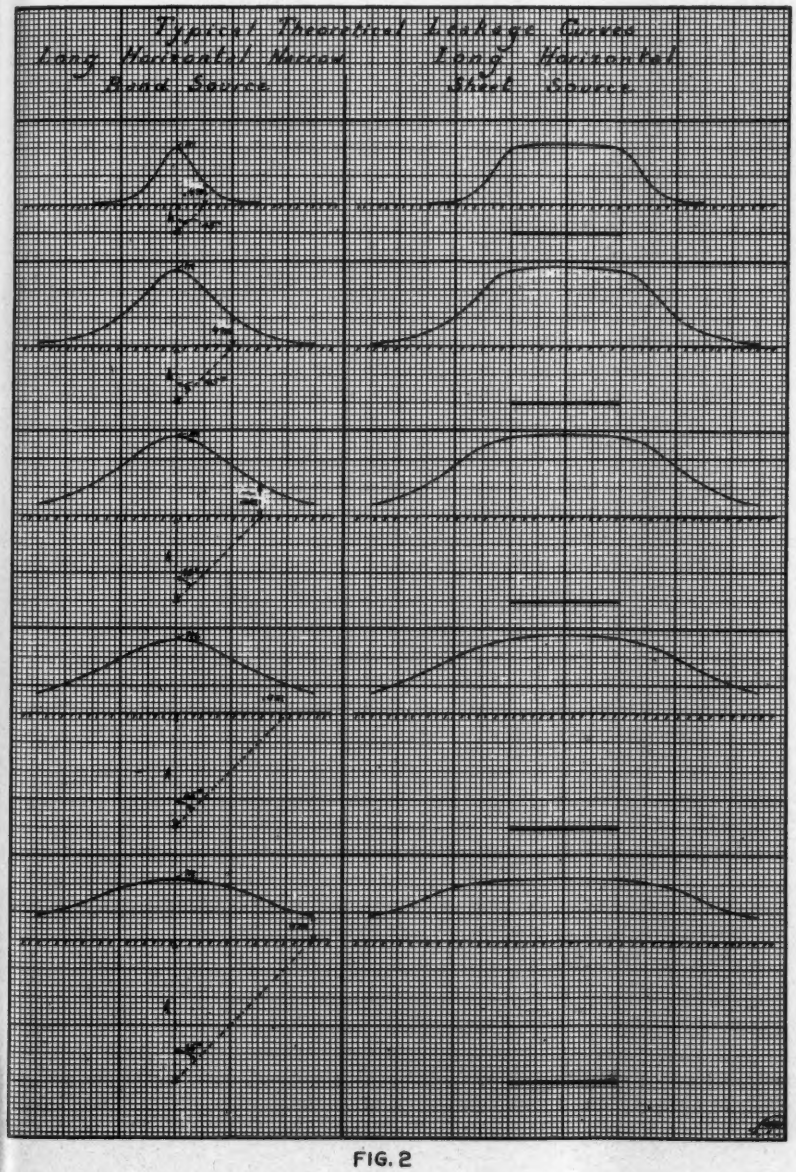

FIG. 2

The existence of microscopic leakage over seemingly well sealed geologic structures is often doubted. The argument advanced is that if a leakage exists, the same leakage, perhaps even of larger intensity, has taken place through geological ages; therefore there should not be any oil or gas, whatsoever, left in the structure since it is postulated that oil and gas reserves are not replenishable. Assuming that the postulate is correct (to which assumption certain geologists might object), the pressure in a structure containing oil and gas must certainly decrease with time. An indirect proof of this is provided by the testing of bottom hole oil samples in which tests the gas saturation pressure has often been found to be higher than the gas cap pressure. This occurs more particularly when the sand formations, from which the oil samples are taken, are very tight or show little permeability, therefore hindering internal convection currents of oil and gas which would bring the fluid phases in equilibrium. This phenomenon is observed above oil fields seemingly well sealed by an impervious and solid cap-rock.

The Leakage Phenomenon

Various theories have been advanced in order to explain the process by which gas from a buried oil and gas reservoir reaches the surface of the earth in microscopic quantities. The first, the **buoyancy theory,** claims that gas moves up from a structure in a manner similar to a bubble of air rising vertically through a mass of water, finding its way in the interstices between the grains and crystals constituting the rock formations. Right above the structure, the openings would be plugged by deposits of salt, wax, etc. This theory is far from being confirmed

by actual measurements. The second, the **surface creep theory**, postulates the vertical movement of gas by surface adsorption or by a wetting phenomenon. No explanation is given as to why the wetting should not take place laterally as well as vertically. It is not explained either why the wetting would not take place at the center, as well as around the edges, of the structure. Furthermore, there is no experimental proof of the existence of a surface molecular creep taking place.

The writer has always postulated, since the start of his geochemical investigations, that the leakage of gas taking place by pressure or concentration gradient inside the earth. Until recently, the writer had no proof of this. However, measurements made by means of a sensitive manometer have demonstrated conclusively that air can seep through the most impervious and wet clay under relatively small pressure differences.

Accordingly, it was thought that a method which would measure directly the rate of leakage from an oil and gas structure should yield interesting results. After trying various procedures, such as was devised and tried out over the Music Mountain field south of Bradford, Pa. and the results were found to be quite in agreement with the theory of leakage according to existing pressure and concentration gradients in the earth.

If one assumed that the earth is a homogeneous and isotropic material, of constant permeability in every direction, and in which a source of pressure is buried, such as an oil or gas field, it is possible to calculate with a fairly high degree of accuracy the rate of gas leakage at the surface of the ground. According to the theory, the flow of gas from the source will take place in every direction but with diminishing intensity as the path of leakage increases. This is represented in the upper part of Fig. 1 and it may be seen that the leakage distribution over a field is in the form of an inverted cup. Should the overburden be anisotropic and composed of superposed layers of varying degrees of permeability, as is normally the case in actual practice, a certain amount of distortion in the leakage path will be introduced. Generally, the effect of superposed layers of different permeability will result in a spreading of the leakage path thereby giving a flatter leakage distribution curve over the field as indicated by the lower part of Fig. 1.

Typical Leakage Curves

Assuming a homogeneous overburden above a source of pressure, theoretical leakage curves have been calculated for various types of pressure sources. These are indicated in Fig. 2. In the left column are found the leakage distribution curves over a progressively deeper, long horizontal and narrow source of pressure. The following qualitative deductions may be derived from the observation of the curves:

1. The maximum rate of leakage is located vertically above the axis of the source.

2. Depth variations of the source do not affect materially the intensity of the maximum leakage. This is based on the experimental fact that the pressure of oil and gas fields increases approximately linearly with depth.

3. The rate of leakage is symmetrical about the vertical through the source and the slope of the curves representing the rate of leakage gradually decreases as the the source becomes deeper and deeper. A broad symmetrical high, without flat top, indicates a deep source. The depth may be calculated by observing that it is equal to the distance from the station of peak leakage to a point along the surface of the ground where the leakage is only four-tenths of the maximum. The effect of an oil or gas field may similarly be calculated as a result of the observation that a pool may be represented by a sheet source which in turn can be assumed to be made of long narrow band sources. Therefore, the total leakage effect may be obtained by considering that the leakage at any point along the surface of the ground is the summation of the leakages at that point due to each of the bands. Interpretation diagrams are available in order to make such calculations and by way of example the theoretical leakage effect of a progressively deeper sheet source is given in the second column of Fig. 2. An inspection of these typical curves reveals that a deep pool may be distinguished from a shallow one by observing the rapidity with which the rate of leakage falls off on the edge of the pool. Again, an estimate of the depth of burial of the source may be made by the empirical rule expressed herein above.

It is expected that the simple curves previously discussed will be considerably modified by structural conditions as well as by physico-chemical conditions.

Oil and gas fields may be classified into two main classes on the basis of the number of physical phases present in the reservoir rock at reservoir conditions, namely in multi-phase and single-phase fields. In multi-phase fields, we have the occurrence of a gas cap, poor in heavy hydrocarbons, from which the gases of leakage are mostly methane (CH_4), and ethane (C_2H_6). A distinct oil zone exists in the reservoir; the separation of the gas cap from the oil zone is normally assumed to have taken place by gravity segregation of the fluids present. From the oil zone mostly heavy hydrocarbon gases, such as propane (C_3H_8) and butane (C_4H_{10}), will leak out.

Therefore, the pattern of leakage over a multi-phase field of the anticlinal type will give a single high for light hydrocarbons, (CH_4 and C_2H_6), and a double high for the heavy hydrocarbons, (C_3H_8 and C_4H_{10}). Incidentally, this double high will constitute a halo around the accumulation. This relationship is indicated in the first column of Fig. 3. What happens over a stratigraphic trap under similar conditions is also given in the same column where a pinch-out exists toward the top of the structure and where a gas cap exists. In this case, leakage curves with a single high are obtained, the heavy hydrocarbon high being displaced down-dip.

The case of a salt dome is also indicated and a double halo is now the obvious result provided there is no oil or gas in the cap-rock.

Single-phase fields may either be dry fields or distillate fields. Due to the high pressures existing at reservoir conditions, hydrocarbons, which are normally in a liquid form, are now in the vapor state and the composition of the gas phase is practically constant throughout the producing sand. No gravity segregation exists. Therefore, it is easily deducted that the leakage profiles corresponding to the structural cases previously studied will now be as given in the second column of Fig. 3. Single highs are now observed for both the heavy and light hydrocarbons in the case of both the anticlinal and stratigraphic traps, whereas the salt dome structure will again give a halo for both types of curve. The above are only a few of the complications which the interpretation of geodynamic surveying leads into. Not only are geological considerations necessary in order to eliminate some of the unlikely possibilities but a sound knowledge of the expected reservoir conditions and of the physical chemistry of the reservoir is necessary as well.

The geodynamic process has therefore the enormous advantage over other geochemical methods, such as soil analysis, to be straight-forward in the interpretation and to yield to a large number of surveys in view of establishing empirical rules of interpretation.

Results of an Actual Geodynamic Survey

After experimenting with various types of field technique in geodynamic prospecting, a piezometric method was finally adopted and the first successful field work was carried out only a few months ago over a recently discovered stratigraphic trap south of the Bradford field in Northern Pennsylvania, the so-called Music Mountain field or Silverville pool. The field was discovered quite accidental-

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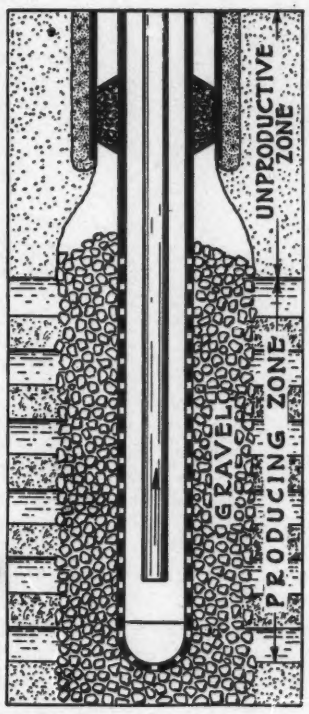

OIL PRODUCTION from unconsolidated and fine sands presents certain difficulties, including sand cutting of screens or perforated liners, the sanding up of flowing wells, and inordinate wear on pumping equipment due to the abrasive action of the sand carried by the oil.

Producers who face this problem will find that gravel packing by circulation offers protection with many practical advantages.

Only by this method can the thickness and character of the gravel pack be varied to match the character of the sand and oil encountered. The gravel pack, through its contact with the sand, holds it in place and prevents its movement.

No lower cost method as fully effective has as yet been devised. The need for expensive screens and liners is eliminated. If ever necessary, the ordinary perforated liner used in this method could readily and easily be extracted and replaced.

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ly by random drilling in August 1937 and oil obtained at about a depth of 1650 feet with a gas pressure of 510 pounds per square inch. The producing sand, the so-called Silverville sand, is a stray or lenticular sand found about 250 feet above the main or third Bradford sand. The Silverville production was the first important flush production found in Pennsylvania for many years. Development was orderly and during periods of low prices, production proration was achieved by gentlemen's agreement. To-date, it appears that the field is well defined in practically all directions by dry holes. The field is about 3.5 miles long and on the average about 1500 feet wide. The general trend of the field is about N-45°-E. It lies on the Northern flank of the Big Shanty syncline about half way between the axis of the syncline and the axis of the Main Bradford anticline. These structural features themselves are tending approximately N-45°-E. The thickness of the sand is very variable and is on the average of the order of 40 feet. No local closed structure is apparent which could justify the accumulation at this point and the pool is truly of a stratigraphic type by permeability variations.

The pressure of the pool is maintained by several of the largest operators and a section of the pool which is repressured at a pressure of 250 pounds per square inch was selected as a proper place to test the geodynamic process. It is believed that the geodynamic process will not give any indication of hydrocarbon over a depleted field which has lost its pressure since the process truly measures the actual leakage and that such leakage can only take place under pressure differentials. A profile about one and three quarter miles long was selected along the new road which crosses the southern end of the field in a northerly direction and ten stations varying in spacing from 400 to 1000 feet apart were selected according to proper topography and surface conditions. The results of the survey are given in Fig. 4. The producing field is indicated between stations 5 and 10. It is worth noting that the field is indicated by stations showing high leakage whereas the leakage becomes gradually smaller as the distance from the field increases. The maximum rate of ethane leakage is given at station 3 as 23 mm³ per 24 hours per square foot. Therefore, over a period of one year, a leakage of roughly eight thousand cubic feet of ethane per square mile takes place; this is a leakage of about eight thousand times larger than the sensitivity of the instrument used.

Another interesting feature of the geodynamic survey over the Music Mountain field is the discovery of the possible existence of a new oil and gas accumulation under pressure at stations 7 and 8 since these show leakage comparable to that observed over the Music Mountain field.

It is worth noting that the field is not defined by a halo as some other theory of leakage tries to explain the phenomenon. Soil analysis was actually tried over this field by means of a single profile and two high concentration points obtained on the edge of the field indicative of the existence of a halo according to the theory underlying this type of measurement.

Conclusions

It is perhaps too early to draw general conclusions concerning the merits and future prospects of the new geodynamic method of prospecting for oil and gas fields, but on theoretical grounds, and on the experience so far gained with the procedure, the following gen-

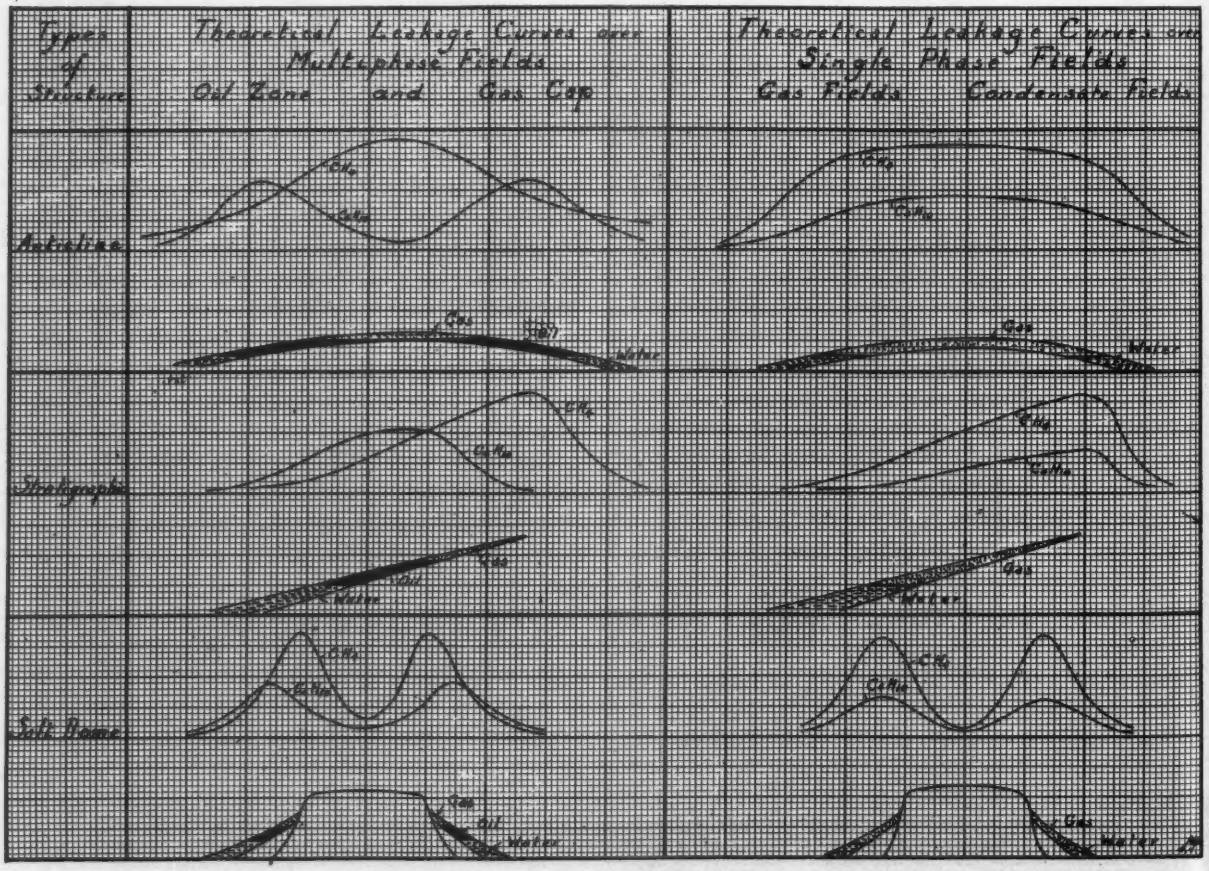

FIG. 3

ANNOUNCING A NEW BAASH-ROSS SERVICE

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BAASH-ROSS TOOL COMPANY, Los Angeles, has been appointed California and Rocky Mountain distributor for the recently developed Barrett & Robishaw Expanding Casing Mills and Whipstocks . . . and now offers a complete milling and whipstocking service in this territory. Methods and equipment used are the very latest developments, incorporating an entirely new . . . more efficient . . . and more economical operating principle.

Barrett & Robishaw Expanding Casing Mills provide a fast, positive means of **completely milling away** sections of casing to any required length. These tools easily cut heavy N-80 series casing, **including collars,** as well as casing sections perforated or ripped. An outstanding feature . . . the self-changing cutters permit any amount of casing to be cut without coming to the surface to replace dulled cutters. This increases milling efficiency, reduces round trips, and materially lowers cost of remedial jobs. Hundreds of milling and whipstocking jobs have been successfully completed with this equipment.

For further information on this new service, get in touch with your local Baash-Ross representative . . . or write for new Baash-Ross bulletin giving full details!

11 WAYS THIS B & R EQUIPMENT WILL HELP YOU DO A BETTER JOB

Removing entire casing sections for more effective whipstocking. Eliminates hazards of old-style side window methods and problem of drilling tools hanging up in casing window.

Removing casing for shooting sand in open hole section with nitroglycerine.

Acidizing sand in open hole section after cutting away casing.

Setting screen against sand face for higher recovery from low pressure or low gravity wells.

Removing casing for gravel packing the open hole section and setting screen.

Squeezing cement in open hole section for water or gas shut-off.

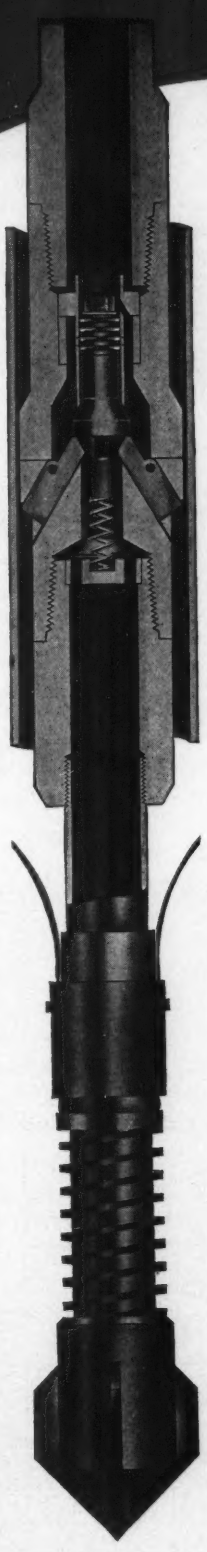
Whipstocking out of casing above stuck liners or screen to set screen in a new section of same sand. Eliminates hazards of pulling stuck packers, liners or screens.

Drilling out all types of drillable equipment.

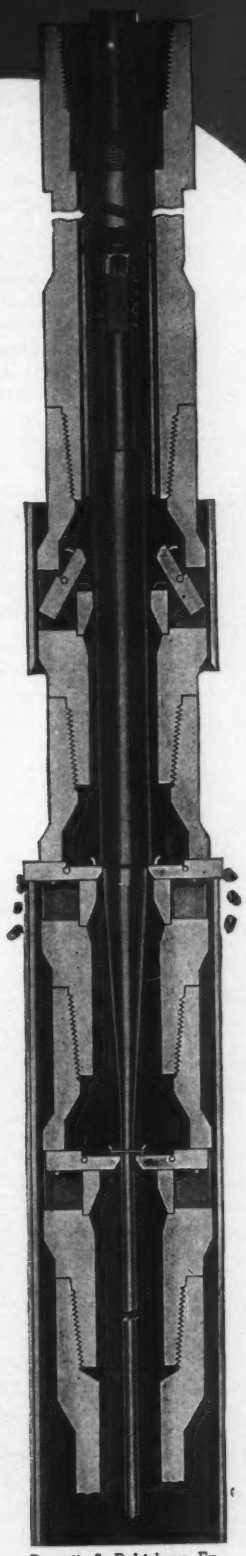
Cutting away stuck liners or wash pipe to loosen at "freeze" point.

Cutting out sections of perforated or ripped casing, including couplings.

Removing entire casing sections to permit underreaming the sand, thus exposing fresh production surface.



Barrett & Robishaw Cutting-Through Tool — Run first to cut through casing at desired depth and then to "start" the milling operation.



Barrett & Robishaw Expanding Casing Mill. Note that cutter assemblies are threaded together. Any number required can be used on one trip into the hole.

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eral conclusions, which should also serve as a guide in using the method, may tentatively be drawn:

1. The geodynamic method provides the only **direct** method of finding **commercial** oil and gas deposits in place under pressure by the observation of the **dynamic** phenomenon of hydrocarbon gas leakage from the reservoir or **high pressure source** towards the surface of the earth or **low pressure region.** The method is therefore **direct** and **positive** inasmuch as it will not discover accumulations of dead oil, depleted pools or drained out structures, but will indicate only reservoirs under gas pressure giving an **active** and **continuous** leakage. At the present writing, the minimum observable leakage is the order of one cubic foot of gas per square mile per year, but this sensitivity could be increased if it were found desirable.

2. The geodynamic method of prospecting does not require the analysis of **either soil air or soil samples** and therefore must be regarded as a distinctly new prospecting method. The measurements are strictly physical in nature, yet since the method deals with the measurement of gas leakage, which other geochemical methods also claim to attempt to measure, it is temporarily classed among the geochemical methods.

3. The geodynamic method should give no indication of leakage above granitic outcrops, igneous rocks, metamorphic rocks, or strongly disturbed sedimentary rocks where oil and gas are not found. Geologists have pointed out the unlikeliness of these types of formations to be oil-bearing. Of course, if for some unusual reason, such rocks would be oil bearing, an indication of leakage would be obtained. This claim should be of particular significance to geologists who have always been skeptical of the reported presence of hydrocarbons in such areas.

4. The patterns of gas leakage observed above oil and gas accumulations should **not remain permanently** nor should they remain constant in intensity when they exist. Contrarywise to the observed facts in soil analysis, patterns of leakage should disappear if the pressure in the reservoir is dissipated. Naturally, a time lag will be observed in order to allow for pressure equilibrium to be reached at every stage of the leakage.

5. **No correction** for the type of soil in which the geodynamic measurements are made has been found necessary. The measurements of leakage are not affected by grain size, soil specific adsorbability or retentivity, ionic saturation, water content, depth of measurement, etc.

6. The gas leakage from an oil and gas field follows the mathematical theory of potential which has been successfully applied in other geophysical prospecting such as electrical, magnetic, and gravimetric processes. Therefore, the results of geodynamic surveys are susceptible to **quantitative deductions** and depth predetermination of the high pressure sources becomes a definite possibility regardless of the presence of shallow accumulations of oil and gas.

7. The halo theory of leakage is not verified by the geodynamic process since generally in the **maximum leakage** is **observed in the center of the geologic structure.** However, in structures such as salt-domes, where the accumulation of oil and gas occurs in a ring-like fashion around the salt plug, a halo of leakage will be observed. Similarly, a halo of leakage of heavy hydrocarbon gas should also be observed where there exists gravity segregation of the fluid in the reservoir

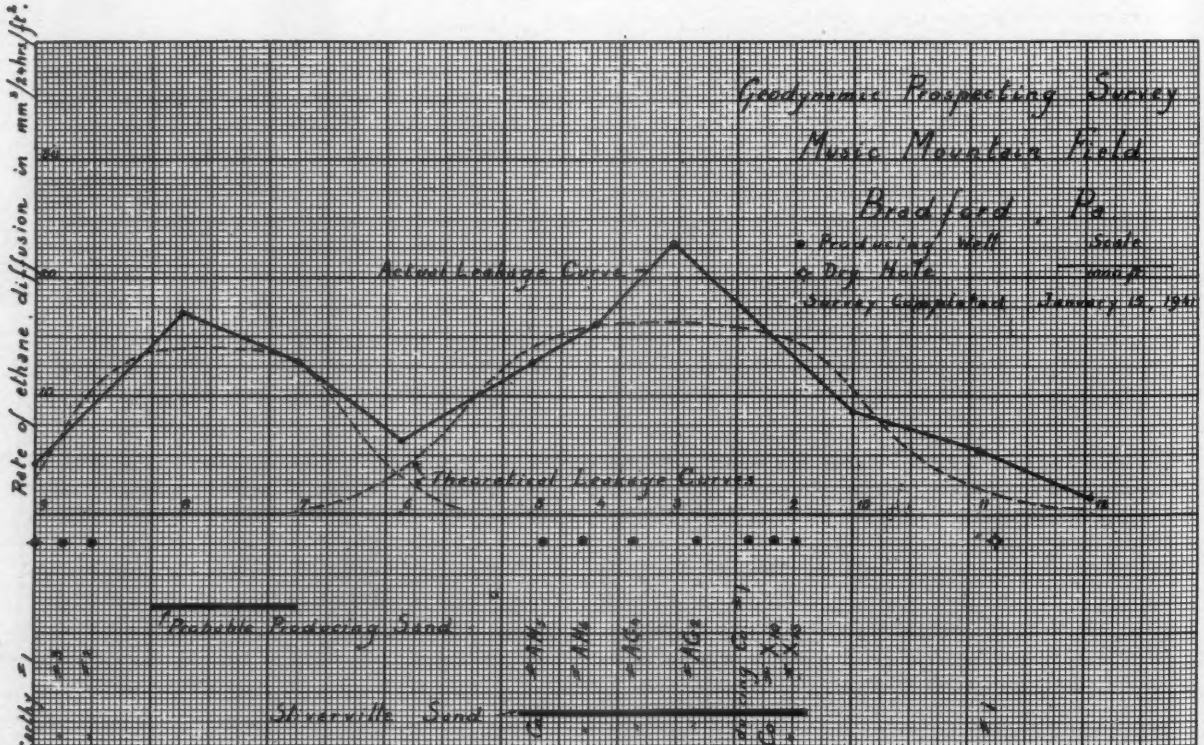

FIG. 4

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THE ADVANTAGES of the Shell Solutizer Process over other sweetening methods are significant.

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rock as is the case in multi-phase pools. When dealing with single-phase pools, there should not be any halo whatsoever.

8. Determining whether a field will be an **oil field, a gas field, or a condensate field** before drilling becomes a distinct possibility through the application of geodynamic prospecting.

9. If executed properly, the results of geodynamic measurements should not show any degree of randomness as the measurements are **independent of soil characteristics.**

10. The interpretation of geodynamic results follows directly from the application of well known mathematical principles. It is therefore, **straightforward** and is not based on empirical rules established by trial and error methods. The work of interpretation does not need to appeal to any working hypothesis or theory which requires revision each time new facts are observed. Any anomaly in the pattern of leakage can always be correlated to various geological features such as shallow pools, faulting, etc.

11. Contrary to some printed statements, the presence of **water horizons should not materially affect the leakage** of gases as it is seldom that subterranean waters move at sufficiently high speed in order to distort the leakage pattern. That gases can diffuse through a water horizon is easily explained. There are two possibilities, either the water horizon is completely saturated or it is not. If it is not saturated, there are openings in the horizon through which gas can diffuse. If it is completely saturated, and this is not a very likely possibility, the gases will dissolve in water at the bottom of the layer and will reappear at the top and be liberated by virtue of their partial vapor pressure.

12. The geodynamic measurements are completely **independent of the presence of organic matter** in the soil. This constitutes an important advantage over soil analysis methods of prospecting inasmuch as various observers have reported a very high degree of correlation between the quantities of hydrocarbon liberated from the soil by heating and the organic content of the soil.

Tide Water Associated Annual Meeting

William F. Humphrey

At the annual meeting of the stockholders of Tide Water Associated Oil Co. held in New York May 1, the eight directors whose three-year terms of office expired were re-elected to serve for three more years. The directors who were returned to office are J. A. Chanslor, Johnston deForest, J. P. Edwards, H. Paul Grimm, John J. Hopkins, William F. Humphrey, Edward L. Shea and Olin Wellborn, III.

A record attendance was reported at the meeting with a total of 6,056,982 shares being represented in person or by proxy, which is more than 88 per cent of the 6,872,566 shares of the company's stock entitled to vote. All of the shares represented at the meeting were voted in favor of the management and for the directors named by the management's proxy committee.

In addition to the election of directors there were submitted to the stockholders at their meeting four other proposals for consideration, which had been explained to the stockholders in detail in a statement which had been sent to them with the formal call of the meeting. These proposals were for the selection of independent auditors, for consent to amend the Company's Management Group Life Insurance Plan, for consent to adopt a Retirement Allowance Plan for all employees, and to amend the Company's By-Laws to provide for indemnification of directors and officers. Each vote of these proposals was approved by the stockholders by a vote of at least 97 per cent of the shares voted.

In commenting on the company's activities in acquiring and developing oil producing properties pursuant to its policy of ever-increasing its crude oil reserves and production to supply its refinery requirements of crude oil, William F. Humphrey, president of the company, stated that "It could be stated conservatively that the company's reserves have been increased since January 1st, 1941, by at least 15 million barrels. At this date the company has more well locations proven but as yet undrilled than it has had at any time during the past several years."

In reporting on the company's activities in keeping abreast of scientific development in the process of refining petroleum products, Mr. Humphrey reported to the stockholders that "The new Houdry catalytic process at Bayonne, New Jersey, should be in operation by June 15. Its completion has been delayed, unfortunately, due to a labor controversy at the Allis Chalmers plant, which had been awarded the contract for a large turbine to be used at the new Houdry plant. At the company's refinery located at Ayon, Calif., there was completed in June, 1940, an alkylation plant which manufactures the basic component of 100 octane aviation gasoline. Since July 1, 1940, such aviation gasoline has been supplied to the United States Army, and bids disclose that for the second half of this year this company will be awarded orders for substantially increased quantities. Authorization has just recently been given to an increase in capacity of this alkylation plant and of other facilities for the manufacture, storage, and shipment of this product which is becoming so increasingly important in National Defense. Whenever the National Defense war demands diminish materially, the products of the alkylation plant may be profitably used in commercial aviation or motor gasoline, reducing the volume of Ethyl lead required."

In concluding his talk to the stockholders, Mr. Humphrey stated that "As a member of the petroleum industry, this company will contribute its share to National Defense. Already it has constructed facilities which will assist greatly in supplying the demand for products of exceptionally high quality, and additional facilities will be installed to increase the volume of such products manufactured by this company. This company's research department is constantly seeking to perfect products which, in their application, will be of importance in the country defense program.

"The report for the first quarter of this year reflects total earnings of $2,859,950, $2,297,450 of which, or 36 cents per share, is applicable to the common stock. In the first quarter of the year 1940, the total earnings of the company were $3,780,220, of which $3,217,720, or 50 cents per share were applicable to common stock.

Oil having the properties of natural petroleum can be obtained from sewage sludge and garbage, according to a recent patent.

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One of the most important instruments in the Baroid Well Logging Unit is the Gas Detector, shown above, by means of which a log of the gas-bearing horizons is obtained while coring or drilling. By means of this apparatus, gas-oil interfaces may be accurately logged, thus enabling casing points to be determined rapidly, economically, and with the realization of the maximum production.

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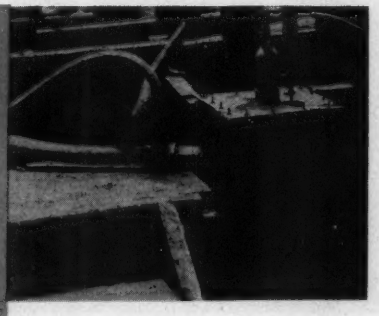
To know a formation accurately by coring methods means that the formation must be cored continuously. This is very expensive.

Another method is to core selectively (spot core); that is, core the sand zones when they are encountered. This entails great risk of passing a valuable zone. For instance, when the drilling rate indicates that a sand has been encountered and preparations are made to core, 10 or 15 feet of the new sand zone, often highly productive, may have been passed; and furthermore, even the most painstaking coring process does not always assure complete recovery of cores.

Baroid Well Logging Service indicates gas, oil, or salt-water zones practically as soon as encountered. In areas such as certain California fields where there are multiple sand bodies—only a few of which may be productive—Baroid Well Logging Service recommends spot cores, if desired, at points which are indicated to be productive. Coring all drilling breaks would be costly and uncertain. Any cores recovered can be analyzed with facilities for core analysis installed in each Baroid Well Logging Unit. This assures greatest accuracy as cores can be analyzed immediately upon recovery.

Side-wall cores have also proved of value where thin sand lenses, indicated to be productive, have been penetrated. Baroid Well Logging Units, with trained operators, are available in oil fields throughout the United States. Illustrated literature on request.



Air is constantly drawn through the gas trap, at left, mounted on the mud flow line. This air, and gas if present, are then carried through a flexible hose to the Gas Detector located in the Trailer.

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Development of Plastics, Synthetic Rubbers

Associated With Petroleum Hydrocarbons

By William C. Goggin
Plastics Division—The Dow Chemical Co.
A. P. I. Eastern Spring Meeting

Plastic materials are not new. More than 70 years ago the first material which subsequently became known as a plastic was recognized as a unique composition. The association of petroleum with plastics—as a raw material—is, however, by no means as old as the industry. In fact petroleum played a very minor role in this field previous to the World War.

The period during the late 'teens can be considered a turning point in the development of plastic materials. Previous to that time plastics were not widely used, and they were limited to a few types, applicable only where their relatively poor physical properties would permit. Since that time the industry has grown by leaps and bounds, and in it petroleum has come to occupy a role of major significance. In order to show how and to what extent petroleum has been associated with the plastics industry, it is advisable to present a brief historical background.

Undoubtedly, the oldest type of synthetic plastic material is cellulose nitrate. Its development is generally conceded to have started with the work of Schoenbein of Germany about 1845. Little is known other than that Schoenbein did some work in this field at that time. The thread of his development was later picked up by Parkes in England about 1855. From that time on, the burden of the development was carried by John Wesley Hyatt and Isaiah Hyatt, two Americans, who obtained several patents on celluloid and collodion during the years 1869 to 1872. [1] History relates an interesting incident in this connection. It is claimed that an American company interested in the manufacture of ivory billiard balls suddenly found that the supply of native ivory from Africa was dwindling. No longer was sufficient material available for the market. The import situation became drastic and in an attempt to obtain a suitable substitute they offered a reward of $10,000. It is said that this reward of $10,000 greatly spurred on the work of the Hyatt brothers, and while they did not obtain a completely satisfactory substitute for ivory, they were instrumental in starting the work from which evolved a great new industry.

The earliest applications of this new cellulose nitrate product were celluloid collars, dental plates, lacquers and later, automobile side curtains. While this plastic has many shortcomings, it is interesting to note that it is a very active item on the market today, and although the volume is not rapidly increasing, it has not decreased greatly over a period of years.

During the same period in which Hyatt was doing his work with cellulose nitrate, some development work on a natural plastic material, shellac, was undertaken. The largest early use for shellac was in the field of phonograph records which were introduced in 1895.

A third plastic material, also a natural product, was developed early in the twentieth century. This product is known as bituminous cold molded plastic. It enjoyed a thriving business during its early life, but has since lost most of its prestige to newer type of plastic materials. One of the remaining uses for cold molded plastics at the present time is the familiar automobile battery box.

The next plastic which appeared on the market can be considered the first true synthetic. This product is known as the tar acid resin, phenolformaldehyde or more commonly, bakelite. Studies of the reaction between the coal tar acid, phenol, and formaldehyde, were undertaken in the year 1872. The reaction, however, was difficult to control and was not really successful until Dr. Baekeland, during the years 1900 to 1910, developed the resins to such a point that they could be successfully molded. Dr. Baekeland obtained several patents in 1909 and 1910, which were of basic importance. [2] Apparently, his original intention was to use this resinous material as a varnish. It was not until he became associated with Mr. Seabury of the Boonton Rubber Company that the possibility of molded bakelite parts was fully realized.

In the early development of Dr. Baekeland's resin, the Boonton Company was offered the molding division of the business, and while the offer was not accepted, it spurred Dr. Baekeland on to realize the possibilities existing in the molding field. By 1909 some fifty commercial parts of molded bakelite were available. The General Bakelite Company was formed in 1910 and later became the present well-known Bakelite Corporation.

Periodically paralleling the developments of phenolformaldehyde resins appeared the development of casein as a plastic material. This is a natural product based on milk, hardened by a subsequent treatment with formaldehyde. It was investigated about 1890 in Germany by Adolph Spitteler. Some of the basic work in casein was, however, done in France prior to this time. Casein became a commercial product about 1900. It was not until 1919 that United States firms actively took up the manufacture of this product. Buttons and buckles from casein now account for a large portion of its use as a plastic.

This short historical summary of cellulose nitrate, shellac plastic, bituminous plastic, phenolformaldehyde resins, and casein brings us to the period from 1915 to 1920. The rush of industrial develop-

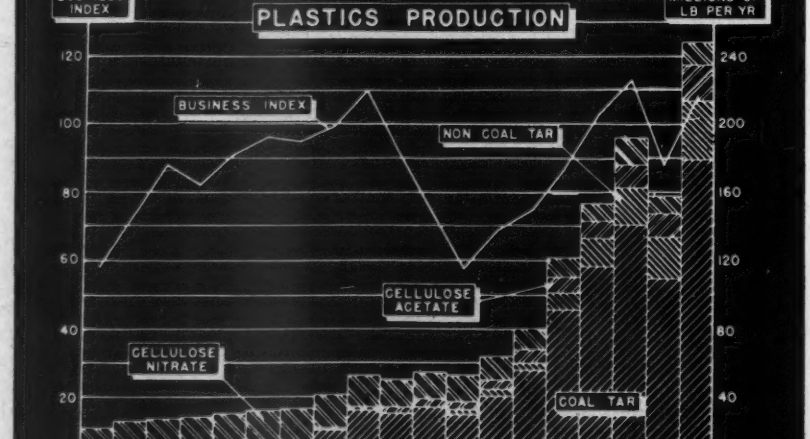


Figure 1

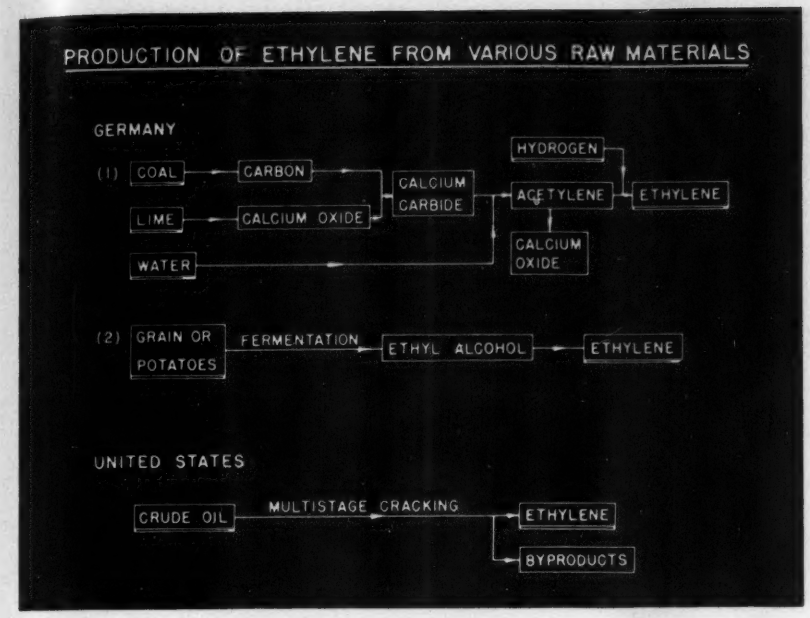


Figure 2

ment during that period not only served to expand greatly the use and production of materials then known, but also, stimulated research work to bring forth new and more useful plastic materials. Only one of these types could be considered a truly synthetic material, that being phenolformaldehyde. During the war synthetic phenol plants were placed in operation. About that time general chemical research became more completely organized. Many new plastics now in commerical production are the results of similar research. In addition to this development, synthetic rubbers, which are closely associated with plastic materials, have been expanded from the one type available during the war into several basic groups. Production of larger quantities of basic materials, the advent of new plastic materials, and the public acceptance of these new products increased the plastics raw material business alone, from a few million dollars in 1920 to an $80,000,000 industry in 1939.

Several important points regarding the development and size of this industry are brought out by Figure 1. This chart of the growth of the plastics industry, as compared with an average business index over the period of 1920 to 1939, definitely indicates increases which are much greater than can be justified on the basis of simple changes in business conditions. It will be noted that the plastics industry did not suffer the severe slump as did industry generally in the lean years from 1931 to 1934. Over the period of 1929 to 1939, coal tar resin business (phenolformaldehyde principally) increased from a volume of about 1,500,000 pounds per year to 180,000,000 pounds per year. Cellulose nitrate has not enjoyed as great an increase but it is however, a material which, though old, still reaches the market in large volume. In 1939 approximately 13,000,000 pounds were supplied.

Cellulose acetate, a product of much research, became available about 1927, and since that time increased to a volume of nearly 21,000,000 pounds in 1939. Some of this volume would have, undoubtedly, been carried by cellulose nitrate had not the cellulose acetate been developed. This probably accounts for the lower rate of increase in the cellulose nitrate plastic consumption.

In a continual stream after 1930 new plastics were introduced to the market. Virtually none of these products are the result of chance findings in chemical or other laboratories, but of thorough, well-organized research. Among this latter group we have such items as ethyl cellulose, methyl methacrylate, polystyrene, and vinylidene chloride. These non-coal tar products represent the field which can be said to be associated with petroleum. Their increase in production over a period of eight years represents nearly a twenty-five-fold gain. This increase compares very strikingly with the approximate six-fold increase in coal tar resins over the same period. The great increase in non-coal tar resins cannot be completely attributed to plastic materials associated with petroleum, however, since that field also includes the ureas, which account for a sizable portion.

Keeping in mind the history, which has been discussed, it can be seen that the early plastic developments were based on the available raw materials, as would naturally be expected. These materials include such raw products as coal, wood, milk, natural shellac, and bituminous asphalt. Later, as the petroleum and natural gas industry developed and as research made available basic knowledge concerning these products, resins and plastic material associated with petroleum began to appear commercially.

Ethylene illustrates the influence which available raw products have upon the method of making finished plastic materials. This comparatively simple

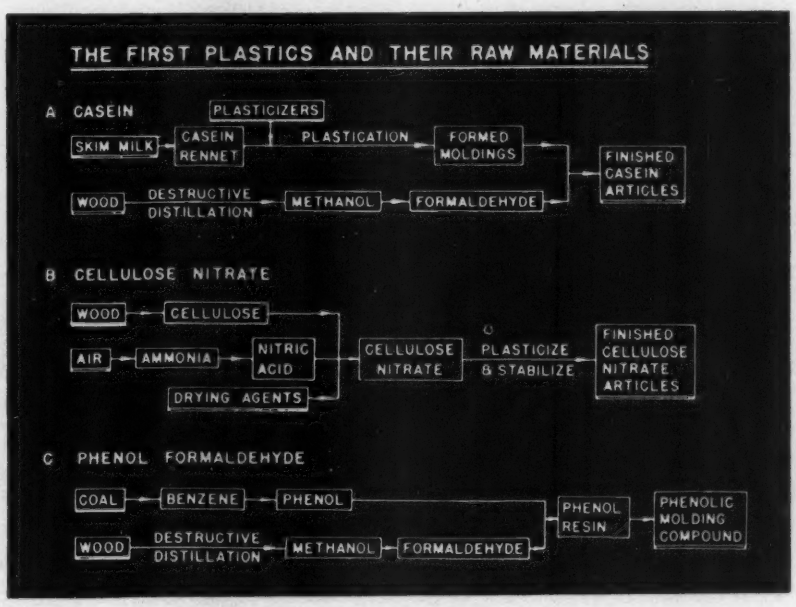


Figure 3

product is the basis for a wide variety of plastic materials. Germany, having only limited supplies of metal available, has found it necessary in the cause of self-sufficiency to develop synthetic materials to replace certain of their metal demand. Needing ethylene for these plastic developments and not having petroleum generally available, except for motor fuel and lubrication needs, Germany has developed a method of obtaining acetylene from coal, lime, and water. This is illustrated in Figure 2. Carbon from coal and calcium oxide from lime can be chemically joined to form Calcium Carbide which, when reacted with water, gives acetylene. This latter product can be hydrogenated to ethylene and then used for a variety of base plastics.

A second and alternative method which has been used to some extent in Germany — here again based on raw materials available in the form of grain or potatoes— has been the fermentation of these products to form ethyl alcohol which, under proper conditions, can be cracked to form ethylene.

In comparison, the United States, which has rather large quantities of petroleum and natural gas available, has found it practical to use these materials as raw products. From crude oil through multi-stage cracking ethylene is obtained directly. Associated with ethylene are a number of by-products which are also of interest to the plastic industry.

Figure 3, containing simple flow diagrams, shows possible method for making the early plastic materials from the then known raw products. For example, casein, formed from skimmed milks, is treated with formaldehyde, the ultimate product from the destructive distillation of wood, to form chemically hardened plastic items. Likewise, cellulose nitrate can be formed from cellulose, derived from wood, and nitric acid, in turn derived from ammonia and air, to a plastic product which, when stabilized and plasticized, gives a thermo-plastic material suitable for making finished articles. From coal and wood, respectively, benzene and formaldehyde can be formed, and from the benzene, phenol, which, when reacted with the formaldehyde gives a phenolic resin of the bakelite type. Thus, it can be seen that the early plastic materials were based on the familiar everyday products, coal, wood, air and skimmed milk.

After 1920, when petroleum and its numerous by-products became more generally known to the chemical industry, research showed them to offer great potentials as basic, inexpensive raw materials for plastics. Many independent research programs were inaugurated, which in the middle '20's began to bear fruit of commercial development. As indicative of the result of some of these developments, Figure 4 includes the product ethyl cellulose, which became available in 1935, methyl methacrylate, available in 1936, Polystyrene, produced commercially in quantity in 1937, and vinylidene chloride, which has recently been introduced in 1939.

(To be Continued)

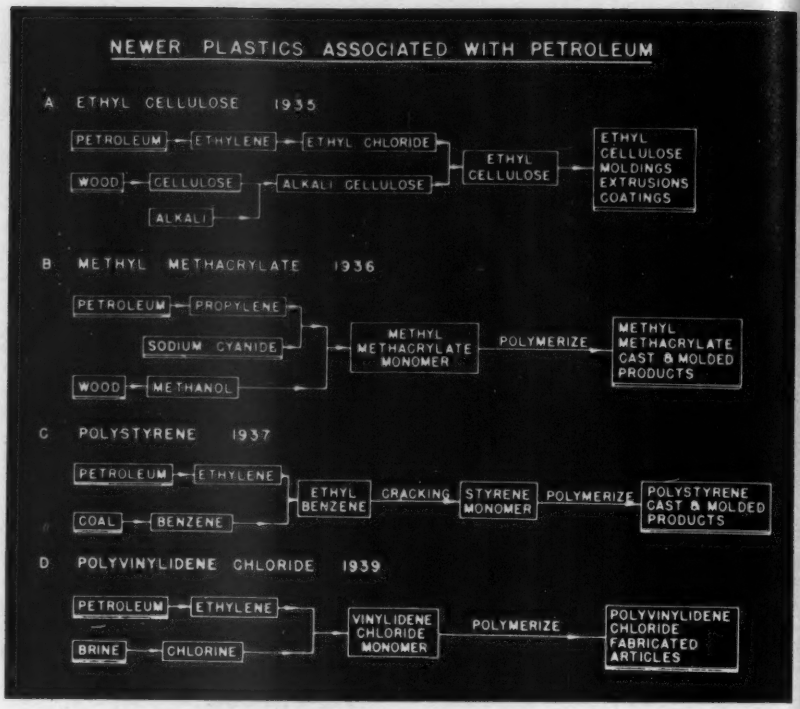


Figure 4

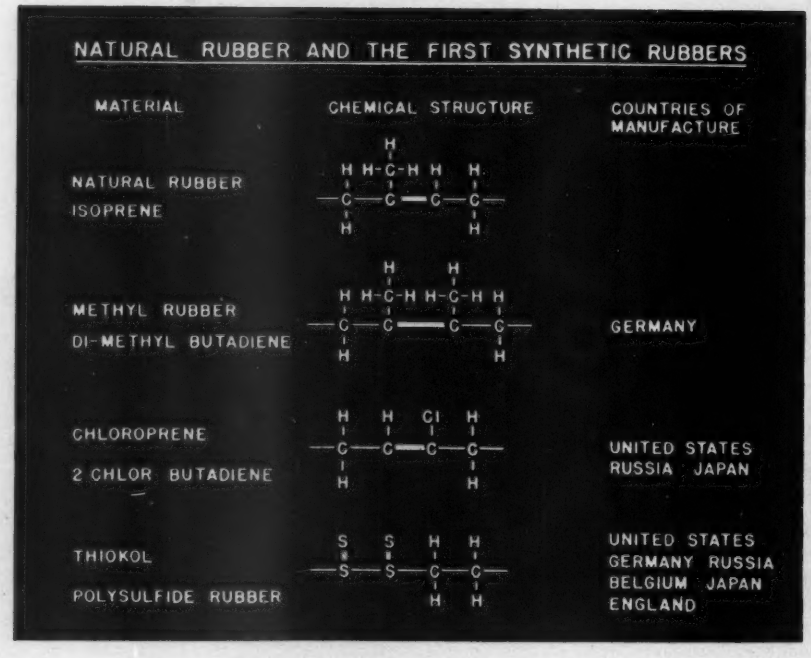
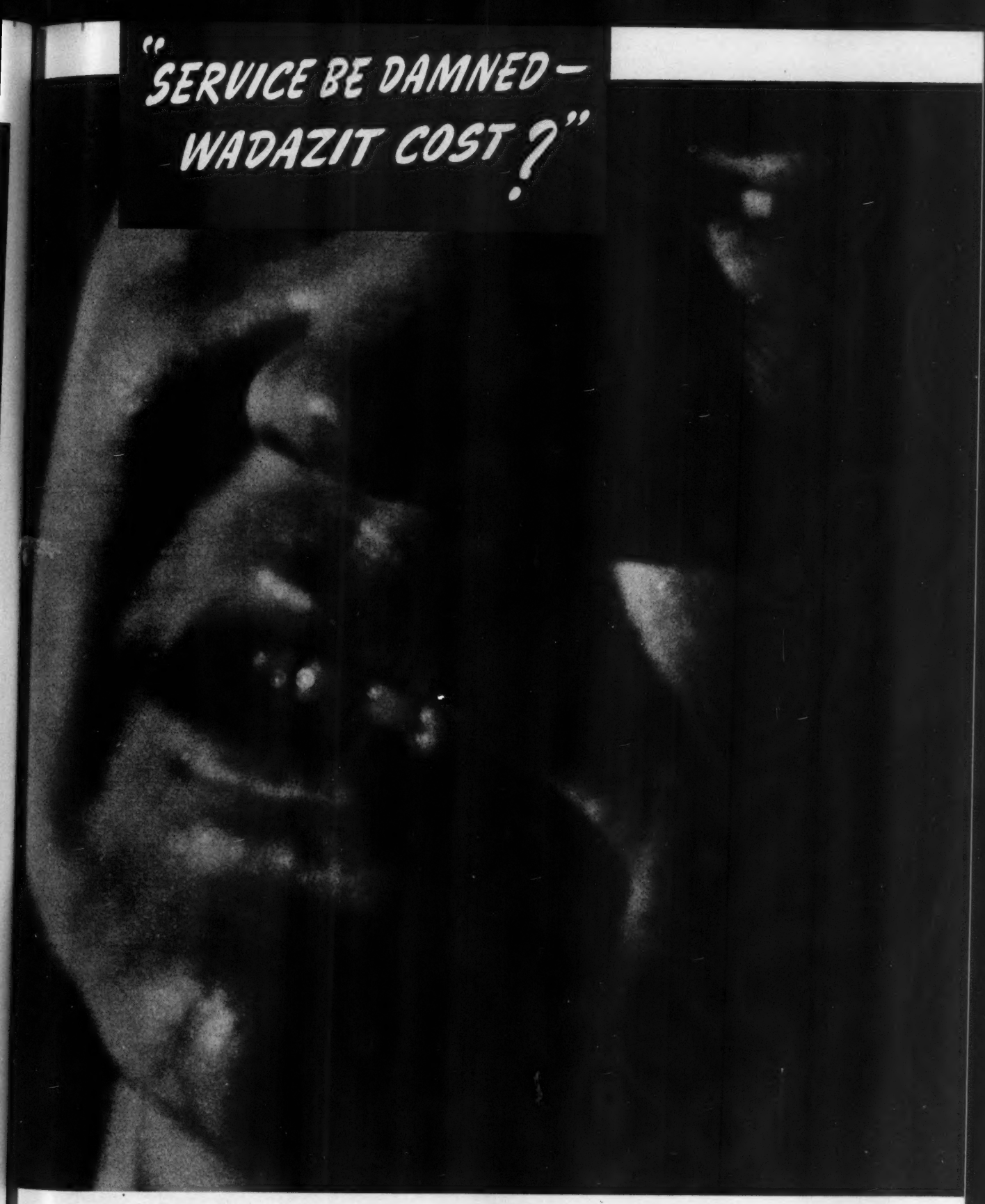


Figure 5

Carey Well Finds Vedder Oil Sand

J. F. Carey's U. S. No. 1, in the north west quarter of sec. 34,26-28, is bottomed in Vedder oil sand at 1355 ft. after finding the zone at 1315 ft.

"SERVICE BE DAMNED— WADAZIT COST?"



Everybody has said that at least once if they've lived very long; said it when they bought a hat, a suit, an automobile or a deep oil well plunger pump.

But,—in every case they've found that what it cost initially, was of the least importance in the long run. No way has ever yet been discovered of building quality into any product and selling it at a cheap price. Quality materials, inherently correct design and expert workmanship cost money; but when it comes to operation and maintenance, they save money.

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A Discussion of Boiler Feed-Water Control

Problems and Their Solutions

By J. A. Campbell, President,
J. A. Campbell Co., Long Beach

The California oil industry, ever striving to improve the efficiency and safety of its operations, has recently experienced some concern over the blowing-up of several of its drilling boilers. The tendency has been lately to go to considerably higher pressures on the boiler in order to get high pressure on the mud. In fact in some soft formations, the mud pump practically jets the hole out just ahead of the drill which is little more than an agitator. The high temperature of this high pressure steam is too much for the old soft-plug which has for years been a warning signal of low water, so the soft-plug is being eliminated on the high pressure set-ups.

The fire box or locomotive type of boiler is widely used in drilling because it has several decided advantages. One of these is that it is a good steamer and will give fairly dry steam if the level is carried at the proper location.

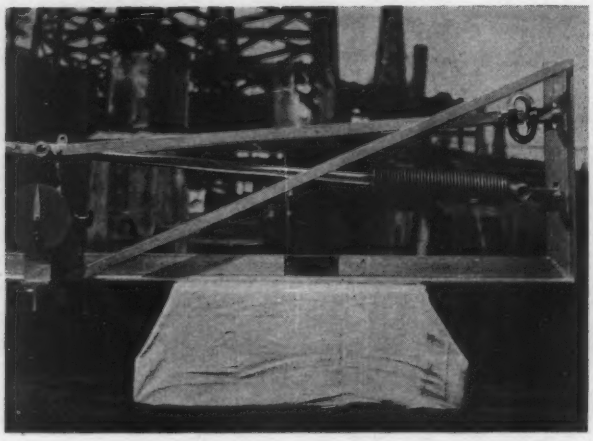
The gauge glass does not show the true level of water in a boiler. The level in the boiler itself is always higher than shown by the glass. The gauge glass is merely one leg of a U-tube. The boiler drum itself constitutes the other leg. U-tubes are always in balance so far as the unit weight of the two legs is concerned, but their relative height is in inverse ration to their relative density. For instance, if you half fill a U-tube with water weighing 8.33 lb. per gallon and then pour gasoline, weighing 4.5 lbs. per gallon, into one side you will find that the height of the two columns above the interface between the two liquids will be in the ratio, gasoline to water=8.33 to 4.5. Of course the longer the U-tube the greater the difference in height in the columns but the ratio remains constant. The same situation exists in a boiler. There is a difference in density between the water in the boiler and the water in the gauge glass for two different reasons. First, the column in the boiler is less dense because it is lightened by steam bubbles. Second, it is less dense because it is hotter. We have found in our work that under extremely heavy firing the difference due to the steam liberation is approximately 20%, normally it is about 10%. Let us say that on a fire-box boiler we are carrying a level in the glass just 4″ above the gauge glass connection. Then under heavy firing our actual level in the boiler will be about 8/10 of an inch higher than this. Since the gauge glass fitting connects into the front sheet the communication is so direct that the water in the glass is practically as hot as the water in the boiler and there is no appreciable difference in density due to temperature.

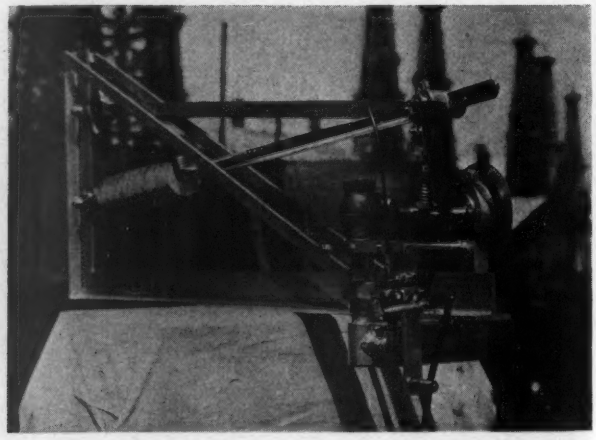
Consider, however, a horizontal return tubular boiler equipped with a gauge column from which the water connection returns to the boiler at a point 30″ below the point where the level is normally carried. The water column is piped out away from the boiler several inches and will show a considerably lower temperature than the water in the boiler. Our tests have shown this on the usual H.R.T. setup to average about 70 degrees F. Water has a high coefficient of expansion. Within this range it is about .000643. Multiplying this figure by 70, the number of degrees difference, then by 30 the number of inches and you get 1.35″. This means that the water in the boiler is about 4.35″ higher in the boiler than is shown by the gauge glass, the 1.35″ difference is due to temperature and 3″ due to steaming. Of course the temperature conditions will vary with atmospheric changes and the difference increases with increased intensity of firing.

We have in our control work encountered boilers where the water connection, from the column tied into a water leg about 5′ down from the point in the gauge glass where they desired to carry the level. This put the level in the drum 8″ higher than that shown in the glass, resulting in lower efficiency and very wet steam.

You get reports of boilers blowing up with a proper level of water in the gauge glass. This is probably a false level due to some stoppage of the lower fitting. Steam can condense in the gauge glass and the condensate if not free to pass back into the boiler will build up in the glass. There is a decided tendency for scale to deposit in the feed water lines to the boiler, especially in the last nipple entering the boiler. This connection is the hottest because of heat conducted from the mass of the boiler and the scale bakes on. These lines if not periodically cleaned out may become so restricted in cross section that they will not pass sufficient water to meet the steaming capacity of the boiler. No provision is made on the average set-up for detecting such a condition while it is developing.

Most of the companies are now using automatic feed water level controls because of their reliability, efficiency, and the resulting better quality of steam. However, the valves of the controller should be given periodic attention to see that scale does not build up on them to the point where there is danger of "lim-





Two views of a new type boiler feed regulator.

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ing up". This is especially important if the valve is of the slide type or has wing guides. Blowing the tube of the controller periodically will break loose any cementing action of the scale and there is little likelihood of the valve sticking if this is done.

The automatic control of feed water to boilers is a highly specialized subject. Though we have been engaged continuously in this work for the past six years we are learning more all the time and are continually confronted with new problems, intensely interesting problems. One of the major oil companies recently came to us and gave us the problem of designing a valve for our controller that would not have any slide area, wing guides or any extra surface inside to which scale might stick. We had designed and built such a controller 18 months before and it had performed exceptionally well. However the valve was of the globe type and had an internal quadruple screw for fast opening. The engineers for this company asked us, if possible, to even eliminate this screw from contact with the water.

In working out this valve we have developed a cam and rotor combination that is fast, positive, and practically frictionless. We utilize a globe valve with stainless steel inner valve and seat. The seat is removable. The rotor is 1⅜" in diameter and is centered in the 1½" I.D. cam by means of a ball bearing on the ½" shaft. The O.D. of the cam is 2½". The cam has two helical slots cut through this ½" of thickness which are ⅜" wide, directly opposite each other and having a pitch of 1" in one revolution. A ¼" pin extends through the stem, the rotor and into the slots. Each end of the pin carries a ⅜" roller slightly less than ½" long which is a neat running fit in the slot. Each slot extends one-third of the circumference of the cam. The dimensions given are for a 1" valve which handles up to 150 H.P. The dimensions will increase for larger valves so as to give wider opening, maintaining the same cam pitch. The cam is securely held in place in a heavy bracket by cap screws from either side. A 1" pyramid cut pinion is secured to the stem. This engages a rack which slides on a rod which is attached to the movable end-casting of the thermostatic tube. An 80 lb. coil spring is slipped over the rod just above the rack which is held in a fixed position vertically by two nuts, one below the rack and one above the spring. The purpose of this spring is to take excessive strain off the valve when a boiler is shut down and the tube fully contracts. The valve, ordinarily, will ride about 1/16" open. When the boiler is shut down the rack travels down with the movement of the end casting until the valve is closed, then the spring starts compressing and the rod slides through the rack until there is a ¼" or ⅜" gap between the lower nut and the rack. The simple adjustment of the lower nut determines where the water level is carried. If the level is riding a little lower than desired, screwing up a turn or so on this nut will open the valve a little more causing the level to settle off a little higher up. If any appreciable change is made in the lower nut a corresponding change is made in the upper one to keep the same spring tension. A husky bracket with side guides and a hand screw in back guides the movement of the rack and keeps it in proper engagement with the pinion. The pyramid cut on the gears permits them to run freely in close engagement with no lost motion. There is sufficient clearance between the rack and the bracket to bring the gears out of complete engagement by loosening up the hand screw. This is desirable when raising or lowering the position of the tube. Provision is made for doing this through the two extra sets of holes in the back bar of the frame. No change whatsoever is necessary in the feed water piping since the rack-rod is long enough to make a 1" adjustment either way and the steam and water leads are sufficiently flexible to permit the change.

A 6" dial is attached to the cam bracket and a pointer hand is fastened to the end of the shaft. This pointer, which attaches to the shaft by means of a screw, may be set at the extreme right-hand holes for closed valve and its movement to the left will record the

Back of the setting dial is a much simplified adjusting and "normalizing" system.

extent of valve opening. There are some extra holes on the radius, in from the middle hole, marking the center of the graduations. I prefer to get the regulator in normal operation and then set the indicator opposite this point. A glance at the indicator then tells the operator whether his boiler is firing heavy or light, since a valve moving open above normal turns the indicator to the left and one less open than normal will have moved the indicator to the right. Another good reason for this setting will be explained later in connection with the use of the normalizer.

Satisfactory performance of any feed water level control is dependent on the proper performance of a pump governor in the steam line to the feed water pump. The control valve is nothing more or less than a variable orifice fixed for constant conditions but varied by the controller with changing conditions. Every one knows that the amount of flow through a fixed orifice depends on the pressure drop across that orifice. The higher the pressure drop the greater the flow and vice versa. Suppose you are trying to feed a battery of boilers equipped with controllers but no pump governor. The pump is hand throttled and carrying just the right differential for a certain load. Suppose the load drops. Less water is being evaporated from the boilers but the pump continues at the same speed. The level starts rising in each boiler and the controllers start pinching down on the valves. This pinches on the pump discharge, greatly increasing the pressure across the feed valves, building the level higher. Assume that instead of decreasing, the load is materially increased. Since the pump was set for normal operation it would not supply the demand and the levels in all the boilers would drop lower and lower.

A pump governor is merely a spring loaded valve in the steam line to the pump equipped with a diaphragm or a cylinder and piston with cup-leathers. The diaphragm is connected by means of a ¼" pipe to the discharge of the pump. The spring is adjusted so that the spring pressure on one side of the diaphragm will balance the total pressure on the other side due to the discharge with the valve open a normal amount. Now should the discharge pressure build up due to throttling of the controller valve this increase in pressure on one side of the diaphragm or piston will compress the spring until the increased strain, built up in it, balances the increased force on the other side. This compressing of the spring shortens it and allows the steam valve of the governor to close somewhat which slows down the pump, which lowers the total pressure on the diaphragm so that the two forces return to balance. Should the load on the boiler suddenly increase the levels will slightly drop, which will open the valves, dropping the pressure on the discharge line and against the diaphragm. This unbalancing of forces causes the strain built up in the spring to somewhat release and force the valve to open, speeding up the pump, increasing the discharge pressure and restoring the levels in the boiler.

Flow is always from a higher pressure to a lower pressure, so to overcome line resistance and maintain a proper differential across the control valves, the governor should be set 20 lbs. to 30 lbs. higher than the pressure in the boiler.

When such a governor is installed it is assumed that the pressure on the boiler will remain constant within a few pounds. Should the load at times be so heavy that the pressure drops considerably, an excess pressure type pump governor should be used. This has the water discharge pressure on one side of the diaphragm and the steam pressure on the other side. In this case the spring is much weaker since it has to balance only the difference between the two pressures. Such a governor will maintain a constant differential between the lines regardless of fluctuations in boiler pressure. On installing such a governor, however, it is imperative that a by-pass valve be placed between the steam and water connections and that it be opened before closing either of the others. Otherwise the high unbalanced pressure on one side of the diaphragm will damage the spring and stem.

Returning to a discussion of the new regulator, it is admitted that great power for motivation of the feed valve is desirable to overcome any tendency to stick. The expansion of metal under heat makes available a great force and that is why the thermostatic tube has proven so popular. The problem is to properly harness this force, guide it and apply it to valve motivation. We use a heavy T-bar frame built with triangular bridge construction. The triangle is the only geometrical figure whose shape cannot be changed without changing the length of one of the sides. The only side whose length can change is the tube and it changes its length only with changes in temperature. The spread of the two legs is only ⅛ the length of the tube, which gives a vertical movement of the end casting six times as great as the length changes in the tube, due to contraction or expansion. This gives a total movement of the end casting of ⅞". The tube itself is of extra heavy red brass, silver-brazed to the Navy-bronze castings. The whole unit is subjected to a 1000 lb. test. The corrugated fins on the lower end of the tube are so effective in heat dissipation that they increase its efficiency 100% . The whole assembly is so rugged that a 200 lb. man can stand on the end of the controller and if the tube is blown he will be rapidly lifted. The pulling down action for valve closure, when the tube cools, is just as positive. The two pivotal joints at the frame are cone bearings and the one at the end casting is a taper joint. These provisions eliminate all lost motion and the ball and roller bearing eliminate any unnecessary operating friction.

There has always been one objection to the thermostatic tube which has been rather serious, yet, because of its many other desirable qualifications, this has been put up with. There are far more of this type in use than all others combined. This objection is now very simply eliminated by means of the normalizing valve which can be used on any controller having a travel indicator. When you blow down a tube, which should be done periodically to blow out any scale or sludge or accumulation of air or carbon dioxide, you blow to atmosphere all of the reserve of cooling water in the lower end. Hot water, just as hot as the steam, flows back from the boiler and fully expands the tube, opening the valve to its maximum extent. Ordinarily it takes this valve about six minutes to return to normal opening. This is accomplished by a partial cooling of the water in the tube, through radiation of heat to the atmosphere, and a complete filling of the tube with this partially cooled water. In this length of time the valve is so wide open the level will rise from one and a half to three inches above normal, and it will take from fifteen to thirty minutes for the level to return to normal. Should the operator blow all the tubes of his battery in succession, as is often done, the feed pump is speeded up excessively, cool water is pumped unduly fast into all boilers, the fuel governor opens up and excessive firing in all the fireboxes results.

Even though he blows his boiler down at the same time he blows his tube it will fill faster than the tube will cool off and the level will go high. Because of this objection tubes and boilers in many cases are not blown as frequently as they should be.

The normalizer consists of a special quick-opening spring-closing ¼" valve connected into the feed water line at some point up-stream from the control valve. When opened it admits a small stream of feed water directly into the hot end of the tube through a 3/16" flexible copper tube. The feed water is seldom over 190 degrees F. and the tube is around 356 degrees, for only 150 lbs. operation, at its upper end. The cooling is very rapid even with 230 degrees feed water.

The operator blows his tube in the

usual way. The valve opens wide, the indicator moving far to the left. Just as soon as he has closed the blow valve he opens the normalizer. The indicator immediately starts moving back toward normal. As soon as it reaches center, requiring only about ten seconds, he releases the normalizer handle and the spring closes the valve. The water will not have risen ⅛" in the glass and every thing is back to normal. This is a good reason for setting the indicator for normal operation.

Still another good reason for this setting is as follows: If the feed piping begins to scale at the point of entry to the boiler sufficiently to retard the flow, higher pressure will be required back of this point to effect passage of feed water. This means the feed valve will have to open up more to pass its normal differential on to the new restriction. Such a condition would immediately show up on the dial by the wider opening of the valve. As it gets worse the valve opens wider and the operator, seeing the valve is open much wider than under normal conditions, knows there is a restriction in the line beyond the valve and can shut the boiler down and locate the trouble before something serious happens.

The regulator, as submitted, represents about six years of intensive research and development work in an effort to produce a precision controller for feed water, that is rugged, powerful, simple, inexpensive, and dependable. It has involved a first hand study of the performance of drilling boilers under all conditions of weather, load, and day and night performance. Many a helpful suggestion and criticism has been given by the fireman, the man who is actually living with the equipment, as well as by the company engineers who know what equipment should do and are very generous in giving the equipment man suggestions as to how, to make it do just that.

Tulsa Nomads Honor Chapters

Tulsa Nomads Chapter gave a reception and dinner in honor of the national president of the board of regents, Ted Sutter, Los Angeles, and all visiting Nomads in Tulsa, from Los Angeles, Houston and New York Chapters on Tuesday Night, May 20, during the mid-year meeting of the A.P.I.

The program was as follows:

Address of Welcome, W. G. Green, president, Tulsa Nomads.

Response, Ted Sutter, president, national board of regents.

Presentation of Awards to Nomad Chapters in recognition of their service during the International Petroleum Exposition, 1940, W. G. Skelly, president, I.P.E.

Acceptance, Los Angeles, E. L. Decker, past national president, board of regents.

Acceptance, Houston, Rex Hamaker, past president, Houston Chapter.

Acceptance, New York, John H. Baird, past president, New York Chapter.

Acceptance, Tulsa, Fred E. Cooper, past president, Tulsa Chapter.

Address—Our Foreign Visitors, W. B. Way, general manager, International Petroleum Exposition.

Maps Available In Reduced Size

Jas. C. Bransford has now made his California oil producing area maps available reduced 50% in size to 27x40 in. Although some workability is lost in the reduction, the new size requires much less wall space for mounting and is more easily filed or placed under a glass desk top. Mr. Bransford publishes a map covering all California fields, one of the San Joaquin Valley, and one of the Los Angeles Basin.

Engineering, Technology, latest news—twice a month in California Oil World.

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THIS LAUGH

OFF!!

In these times of doubt **Walt Brown** comes along with this one:

"Daddy, may I ask you a question?"

"Yes, son, just one more and that will be all for tonight, what is it?"

"If a doctor is doctoring a doctor does the doctor doing the doctoring have to doctor the doctor the way the doctor being doctored wants to be doctored, or does the doctor doctoring the doctor, doctor the doctor the way he wants to doctor the doctor?"

And **Eric Craig** suddenly remembered this one:

Two actors who were jealous of each other met in a barroom. They exchanged frigid nods.

"How are you getting along?" asked one presently.

"Pretty well," replied the other, "Still keeping alive."

The first man eyed his rival steadily for a second, and then asked casually: "What's your motive?"

Recent news in the headlines recalls to one of our CNGA raconteurs that series of notices posted by a London woman who ran a small pub.

In the early days of the budding World War II, the woman put up the following announcement concerning the fish and chips:

"On account of Hitler, the portions will be littler."

Some weeks later customers saw the following appended to the notice:

"On account of Hesse, the portions will be less."

Then came the day when the pub failed to open its door. There in the tiny window was a third notice:

"On account of Goering, I've returned to my old profession."

Then, there is **Johnny Jackson's** story recalling the new order of things:

Sergeant (after war game): Private, didn't you realize you were exposing yourself to an imaginary enemy only 250 yards away?

Private: That's all right, sergeant, I was standing behind an imaginary rock 25 feet high.

And this is one overheard by **Hal Miller:**

Host: What kind of a chaser would you like?

Lady guest: Well, I prefer him tall, dark and handsome, and with a lot of money.

Anonymously comes this one:

Well, Sam, I see you're back for fighting with your wife. Liquor again?

No, sur, Judge, she licked me dis time.

Also:

"I don't know what's the matter with that little man over there. He was so attentive a few moments ago and now he won't even look at me."

"Perhaps he saw me come in. He's my husband."

Indian girl have plenty of fun with beau and error.

Jack Lynn recounted this story:

Grandmother was a diabetic patient, and, although put on a strict diet, she would not play the game, and was "cheating" all the time. After numerous violations, she was sent to the hospital.

Because of the crowded condition at the hospital, the only available room was in the Maternity Ward. After she had been there a few days, her little granddaughter paid her a visit and was lolling in front of the door of her grandmother's room when some visitors walked past.

"What are you doing here, little girl?"

"I'm visiting my grandmother."

"Grandmother." said one of the visitors in astonishment. "What is she doing here?"

"Oh," said the little granddaughter, "she's been cheating again."

Dud Hughes takes us back to camp again with this one:

Private Smith was before his commanding officer and charged with being disorderly in canteen.

"Now, Smith, this is the tenth time you have appeared before me on this charge. What have you to say?"

"Well, sir, I hope our acquaintance will ripen into friendship."

And this reminds us of the Colonel who was surveying a barricade of sandbags which had just collapsed.

"Does the Sergeant know about this?" questioned the Colonel.

"He ought to," answered the verdant recruit, "he's underneath!"

Names used on this page are entirely fictitious, and any resemblance to persons either living or dead is purely coincidental.

WEIGHT INDICATOR POINTS
Weight indicators and gauges that leak not only require costly shut-downs for repairs—but can give misleading information that may result in serious and costly trouble.
With the "Sealtite" Weight Indicator and "Sealtite" Mud Pump Gauge, factory filled and sealed with hose rated at 20,000 pounds per sq. inch bursting pressure, no shut-down time for repairs is required, and both are instantly ready for operation on each new location.
It's only one more time and money saving feature the "Sealtite" offers in the way of complete drilling control.
MARTIN-DECKER CORP., LONG BEACH, CALIF.

Field Development

Los Angeles Basin

Sunset To Drill Puente Hills Well

A new wildcat of more than usual interest is shortly to be drilled by Sunset Oil Co. in the Puente Hills one mile north of the old Whittier field. The test Anita Baldwin No. 1, will be located approximately 400 ft. from an old Shell well of the same name drilled to 4563 ft. in 1918 and which produced an appreciable quantity of oil before its subsequent abandonment with the discovery of Signal Hill. Situated up dip from the old project, Sunset's try is calculated to find the productive horizon at least 150 ft. higher, auguring well for its productive possibilities. Cross faulting on the Puente Anticline provides closure for the play.

Aliso Canyon Field Gets First Pumper

Tide Water Associated Oil Co. completed Porter No. 33, an outpost well, as the first pumper in the Aliso Canyon field. The hole was drilled to 5491 ft. but was plugged to 5326 ft. where a 180 ft. interval is being produced.

Only driller in the field is Tide Water Associated's Porter No. 5 which is near the 1000 ft. level. Location has been staked for Mission No. 1, a semi-wildcat half a mile east of present production.

Inglewood Well Slowed by Fish

Progress of Jefferson Oil Co.'s Smith No. 1, at the north end of Inglewood, was interrupted at 7159 ft. when drill pipe stuck in the hole at 5150 ft. necessitating the spotting of oil to loosen. The well is now something of a mystery as at 5570 ft. it correlated more than 1000 ft. higher than the Federal Oil Co. Smith No. 1 but at present depth has lost nearly 700 ft. of that advantage.

LOS ANGELES BASIN WILDCATS

Area	Well	No.	Section	Depth	Status
Athens	Rankin & Williams	1	7, 3-13	9098	Idle
	Lytle, Robt. S., Operator, Anderson	1	1, 3-14		Rigging up
Castaic	Barnsdall Oil Co., Honor Rho A-19-1	1	7, 4-16	1580	Drilling
	Collins Oil Co., Explor.	1	8, 4-17	1355	Idle
	Hathaway Co., Ram	1	31, 5-17	2594	Stdg. plugged
	Jasper, Fred S.	1	17, 4-17	2396	Drilling
	Morse-Mangold, Inc., McDermott	1	26, 5-17	1966	Idle
	Western Gulf Oil Co., Lechler	2	31, 5-17	6601	Drilling
	Worland Oil Co., Jenkins-Owens	1	18, 5-16	2940	Idle
	Young, Roy, W., Inc., Walker	1	11, 4-16		Location
Coyote—West	Wilshire Annex Oil Co., Comm.	1	14, 3-11		Foundation
Inglewood	Cliff Baker, Operator, L.A.I.	1	29, 2-14	2855	Drilling
Newhall	Aztec Oil Co., Sanborn	1	6, 3-16	4208	Drilling
	St. Anthony Oil Corp., La Salle	1	10, 3-16		Foundation
	The Texas Co., Whitnah	1	14, 3-16	2912	Drilling
Palos Verdes	Newton Development Co., Palos Verdes	1	13, 5-15	735	Drilling
	Surety Holding Co.	1	22, 5-14		Foundation
Redondo	Cherokee Oil Co.	1	32, 3-14		Bldg. rig
	Pettijohn, J.E., Domingues Estates	1	5, 4-14		Foundation
	Wood-Callahan Oil Corp., Domingues Estates	1	5, 4-14	2247	Drilling
Whittier-La Habra	Sierra Pet. Co., Cole	1	2, 3-11		Grade
	Orange County				
Costa Mesa	Thompson, Milton N., Banning	1	9, 6-10	5649	Cleaning out
Kraemer	Valley Petroleum Co., Kraemer	1	25, 3-9	2755	Pumping water w/ trace oil
	San Bernardino County				
Carbon Canyon	May, Homer, Oasis	1	31, 2-8		Rig
Chino	Prado Oil Corp., Lamp	1	32, 2-7	300	Stdg. cem.

NORTHERN COUNTIES WILDCATS

County	Well	No.	Section	Depth	Status
Colusa	Pacific National Pet. Corp.	1	17, 17n-4w		Rig
Contra Costa	Lafayette Oil Co., Morris	1	28, 1n-2w	925	Drilling
Mendocino	Keyt, N. F.	1	3, 12n-17w	516	Rigging rotary
Monterey	Loma Grande Oil Co., Corey	1	23, 24s-10e	3915	No report
	Priest Valley Pet. Co., Greve	1	22, 20s-12e	2885	Bailing water
Sacramento	Amerada Pet. Corp., Kuhn Comm.	1	8, 3n-3e	4300	Shut in
	Amerada Pet. Corp., Wor Comm.	1	29, 4n-3e	100	Idle
	Standard Oil Co., Oulton	1	9, 3n-3e	1980	Drilling
	Superior Oil Co., Larsen	1	8, 3n-3e		Location
	Superior Oil Co., McCormac	1	9, 3n-3e		Location
	Portable Drlg. Equip & Supply Co.	1	35, 8n-4e	310	Idle
San Joaquin	Standard Oil Co., Blewett	2	25, 3s-6e	5455	Drilling
San Mateo	Ra-Lite Petroleum, Inc., Bell	5	16, 7s-4w	1200	Idle
Stanislaus	Don Pedro Oil Co.	1	9, 6s-9e	1906	Idle
Yuba	Wright, L. G., Cox	1	18, 14n-5e	1795	Idle

THE SPIRIT OF 76

by JOHN CLINTON

* * *

In case you've been waiting breathlessly to hear the announcement — here it is: "The 1941 Clinton Awards For Traffic Pains in the Public Neck." Winners are being sent silk-lined incendiary bombs.

* * *

***First Award* — to the guy who drives in the middle lane and glares at you if you honk your horn. *Second Award* — to the traffic signal at First and Elm — I never used to be able to get away from it. Even small kids on tricycles could beat me. *Third Award* — to the heirs of Thomas Q. Traffic, the inventor of the traffic problem!**

* * *

All of which is a lighter way of saying seriously that traffic is bad stuff! That's why Union Oil Company has spent so much money, so much time and so much ingenuity on perfecting New 76 Gasoline—for, as you regular readers know, New 76 is especially made for traffic driving.

* * *

It gives you the power to pass the middle-lane loafer—to take off from signals right along with the best of them. And another thing that the Union research men worked out was a combination that would give you silk-smooth performance at these pesky but necessary slow speeds in traffic.

* * *

If I were you, I'd accept Union's invitation to make your own test. Wait till the tank's almost empty (so you can really tell) and fill it up with New 76—then hunt yourself up some traffic and jump in. *I* tried it, and it does just what Union says it will do. Try it, will you? I think you'll thank me for egging you on.

UNION OIL COMPANY

Most plausible explanation is that of a large throw fault intersecting the Federal at 5600 ft. and the Jefferson at 6800 ft. If fault there be, its effect, if any, on production remains to be seen.

R. R. Bush Oil Co.'s two wells, Merchants No. 1 and Smith No. 1 are nearing 6000 ft. in depth while Hogan Petroleum Co.'s Machado No. 1A and Oscar Howard's No. 1 are somewhat shallower.

On the southwest flank of the field, Standard Oil Co. perforated the 7 in. casing in L.A.I. No. 3-1 in several intervals from 8380 to 8700 ft. and swabbed in flowing a small quantity of 26 gravity oil. On an 18 hour test the gas rate declined from 7,000,000 cu. ft. daily to 1,450,000 cu. ft. with a corresponding drop in pressures. Shut in, both casing and tubing pressure built up to 3000 lbs.

Royalty Service Corp. has derrick up for Marlow-Burns No. 1 which will be a northeast outpost.

Signal Hill Well Pumps 160 Bbl. Rate

Demonstrating the possibilities of Signal Hill, Ohenstein & Withers plugged old No. 1A to 3665 ft., perforated two intervals below 3520 ft., and recompleted pumping 160 bbls. of 28 gravity clean oil. The well is located near the crest of the hill at the northeast corner of 23rd St. and Ohio Ave.

Royalty Service Corp. is coring its Orange Ave. north flank test, Burgess No. 1, near 6600 ft. while at the east end of the field, Richfield Oil Corp. is below 6350 ft. in Connett No. 3.

Fullerton Oil Plans New La Habra Project

Fullerton Oil Co. is planning to drill its No. 7 well in the district between Whittier and La Habra near No. 6 which was completed last winter flowing gas and a modest amount of oil from separate intervals at 2000 and 2900 ft. Properties in the area are held by Union, Fullerton and Standard Oil Cos.

Union Completing West Dominguez Well

Union Oil Co. is completing its Austin No. 9 offsetting Hiles Drilling Co.'s Grant No. 1 at the extreme west end of the Dominguez field. Hole was bottomed at 7218 ft. and formations are open below the shoe of the 7-in. casing at 7188 ft.

One location south of the Grant well, Crawford & Associates No. 1 is preparing to set casing over the top of the sand while Crawford-Hiles & Associates No. 1 is below 5000 ft. and Edge-

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NOW is the time to decide . . . will *you* go on paying more than is necessary for Compensation Insurance or will you do as so many other leading oil companies are doing: reduce your NET COSTS by placing your insurance with the Industrial Indemnity?

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Thus the policyholder can reduce the amount *paid out* in premiums and *get back* substantial Cash Dividends each year.

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SAN FRANCISCO

mont Oil Co. No. 1 has passed the 2500 ft. mark. West Dominguez Associates has spudded in between Edgemont's No. 1 and Hiles Drilling Co.'s discovery well. In various stages of preliminary work are Johnson & Richardson, John H. Marion, Hiles-Crawford & Associates and Dominguez Associates.

Bartholomae Starts New East Coyote Well

With Stern No. 5 on the beam for 170 bbls. a day from 6944 ft., Bartholomae Oil Corp. is preparing to drill its No. 10 at East Coyote. C. W. Camp is nearing completion in No. 21 on Tuf-free property near Carolina and Golden streets.

Silver Tests Ranger Sands

Silver Petroleum Co.'s No. 2 became the first well in the West Wilmington section to attempt production in the Ranger zone when it was finished with 8⅝ in. casing landed on bottom at 3275 ft. and cemented at 3130 ft., the top of the perforated interval. As the well sanded up shortly after it was put on the pump, no good estimate of capacity is available but early indications were that oil of about 14 gravity would be produced in commercial quantity.

In the same area, Los Angeles Basin Petroleum Co. is preparing to complete Phillips No. 1 in the Terminal zone with the hole open from 3550 to 3750 ft.

Foundation In For Saugus Test

Roy W. Young, Inc. has foundations in for Walker No. 1 on Conroy Dome in sec. 11,4-16 northeast of Saugus. The well will be carried down as a Modelo test.

Wood-Callahan Drills Redondo Outpost

Wood-Callahan Oil Corp. is drilling below 3000 ft. in its outpost well on the north flank of the Torrance field near Redondo Beach. The well is pointed for the Main Zone which was productive in Union Oil Co. wells on the property.

Havenstrite Tests Third Lincoln Well

R. E. Havenstrite, Operator is preparing to test further in Lincoln No. 3 at Del Valle after cementing a blank liner on bottom at 7435 ft. It is planned to "sharp shoot" selected intervals below the shoe of the 7 in. casing which is cemented at 7265 ft. Previous tests, though wet, recovered an appreciable amount of oil.

West of the field, Fred S. Jasper is drilling Videgain No. 1 below 2600 ft. in sec. 17,4-17.

Wilshire Annex Starts West Coyote Wildcat

Wilshire Annex Oil Co. has started work in its long awaited wildcat well in the West Coyote district and now has the derrick ready for the installation of drilling equipment. Located approximately 500 ft. west of the east quarter corner of sec. 14,3-11, the project seeks a new accumulation half a mile west of present field limits.

St. Anthony Derrick

St. Anthony Oil Corp. is building derrick for its La Salle No. 1 near Highway No. 99 in sec. 10,3-16, Newhall district. The project is located north of the Texas Co.'s Whitnah No. 1 which is coring gently dipping Pliocene formations below 3212 ft.

Aztec Oil Co. has temporarily suspended operations in its Sanborn No. 1, sec. 6,3-16, at 4300 ft.

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San Joaquin Valley

C. C. M. O. Co. Seeks Famosa Production

Chanslor-Canfield Midway Oil Co. has let contract to Bell & Loffland to drill Famosa No. 12-12 in search of the shallow, small production proved profitable in many east side Valley fields.

Located in sec. 12,27-26, 5 miles west of McVan production, the well will be the latest of many to prospect the general area.

Raisin City "Cat" Cores Eocene Zone

Shell Oil Co's Fresno county wildcat, Properties, Inc. No. 8-18 in sec. 18,15-18, is coring ahead at 6355 ft. after picking up the green sand in the barrel at 6345 ft. Top of the Domengine was found at 6320 ft.

Late flash indicates discouraging findings below 6420 ft. The well may continue for more thorough testing before plugging back, however.

If the Eocene zone here is conformable with the Coalinga area the green sand will be relatively thin and the well should soon top the siltstone which overlies the main sand bodies.

Present objective is to find a sand of better quality than those already proved probably productive in the Miocene.

Failing to find deep production the present plans are to plug back for trials of Temblor sands which yielded some 22 gravity oil on a formation test from 4697 to 4754 ft. and which appeared capable of small production.

A little more than 20 miles northeast of the city of Fresno, D. M. Gay is rigging up to drill a wildcat in sec. 3, 11-21 of the Friant area. Only previous drilling in the township was by San Joaquin Valley Oil & Dev. Assoc. which drilled a barren 2500 ft. Miocene test in section 31 during 1921-22.

Some 15 miles west of Coalinga production in sec. 19,19-13, near the west Fresno county line, Gatos Creek Oil Co. has resumed drilling its cable tool job and was last heard from at 807 ft.

Texaco Wildcat Tests Buttonwillow

Bottomed in hard shale at 10,864 ft., The Texas Co.'s Buttonwillow area wildcat, S. P. No. 47-15, is nearing the critical depth.

Located in sec. 15, 29-24, the well has thus far reported only ditch shows while passing the 10,480 ft. mark.

The well seeks deep production indicated by two previous drillers which found sand bodies showing promise but which in each case proved too tight to afford a proper reservoir for accumulation.

With the sands known to be present the trick seems to be to find a closure containing sands permeable enough to have become saturated. Deepest earlier drilling in the area carried to 12,989 ft.

Superior Drills West Greeley Try

Six miles west of Greeley production, near the southeast corner of sec. 18,29-25, Superior Oil Co. is drilling KCL No. 13 at 5700 ft.

Located in the central Valley, the mecca of myriad sub-surface parties, and in close relation to fields producing from both the Stevens and Vedder zones, it is probable that the test will prospect to depth.

Richfield Re-Enters Grapevine Area Play

Again planning to drill its large south Valley holdings in search of production generally expected one day to be discovered, Richfield Oil Corp. has located Tejon No. A-2 near the east quarter corner of sec. 19,11-18, at the westerly limits of the Tejon Ranch.

The company recently drilled Tejon No. 1 to a barren 10,940 ft. in sec. 2, 10-19. It is understood that lease requirements of the several thousand acres demand an exhaustive exploration program. The company has already done a tremendous amount of geophysical surveying.

The new project lies at the base of the Tehachapi Mountains, some 3 miles east of Ohio Oil Co.'s No. D-2 which was abandoned at 5896 ft. during 1937. This well entered gray sand at 5720 ft., the base of the Fruitvale shale. Top of the Santa Margarita was found at 2990 ft., the upper shale at 3817 ft. while the lower was entered at 4960 ft. No showings were reported in any of the zones opened to this depth.

Near the center of the northeast quarter of sec. 28,11-19 Continental Oil Co. is coring at 5640 ft. in shale with streaks of sand reported to show spots of oil. Located north of the small pool of

SAN JOAQUIN VALLEY WILDCATS

Area	Well	No.	Section	Depth	Status
	Fresno County				
Friant	Gay, D. M.	1	3, 11s-21e		Rigging up
Gatos Creek	Gatos Creek Oil Co.	1	19, 19-13	807	Drilling
Raisin City	Shell Oil Co., Properties, Inc.	8-18	18, 15-18	6130	Drilling
	Kern County				
Belridge—South	Sentinel Oil Co.	1	10, 28-20	1640	Drilling
	West Belridge Oil Co.	1	3, 28-20		Location
Buttonwillow	The Texas Co., S. P.	47-15	15, 28-24	10864	Drilling
Devils Den	Herzog, R. D., Collins	1	26, 25-18	361	Idle
	Herzog, R. D., Marine	29	26, 25-18	112	Idle
	Herzog, R. D., Marine	30	26, 25-18	125	Idle
Edison	Crude Oils, Inc., S. P.	7	31, 29-30	460	Idle
Famosa	C.C.M.O. Co., Famosa	12-1	12, 27-26		Foundation
Grapevine	Continental Oil Co., Tejon	A-1	28, 11-19	5640	Drilling
	Kern Line Oil Co.	1	19, 11-19	8390	Plugged 8150
	Richfield Oil Corp., Tejon	A-2	19, 11-18		Location
Greeley—West	Superior Oil Co., KCL	13	18, 29-25	5565	Drilling
Lost Hills	Tide Water Assoc. Oil Co., Isolis	46	16, 27-21		Rig
Maricopa	Bankline Oil Co., Well	24-24	24, 11-23	4325	Abandoned
McClung	Ohio Oil Co., KCL	G-1	36, 29-26	6593	Drilling
	Union Oil Co., KCL	31-3	3, 30-26	11038	Drilling
Mt. Poso	Carey, J. F., U. S.	1	34, 26-28	1355	Idle
Richgrove	Borget, A. J., Kendall	1	16, 25-27	1700	Idle
	White River Expl. Co., Salca	2	8, 25-28	1707	Abandoned
Shafter	Continental Oil Co., KCL	C-2	35, 27-24	11349	Redrilling
	Kings County				
Kettleman So. Dome	Bristol Oil Co., Smith	1	35, 24-19	8054	Plug.—1729—rig pump
Pyramid Hills	Pyramid Prod. Co., Spreckles	2	16, 24-18		Rigging up
	Tide Water Assoc. Oil Co., West Slope	76	20, 24-18	3640	Drilling
Reef Ridge	Easterbrooks, S. F.	1	11, 23-26	309	Drilling
	Tulare County				
Terra Bella	Arnold, V. F., T.B.I.D.	1	5, 23-28	275	Idle
	Stout, C. W., Stout	1	35, 22-27	1113	Drilling

Grapevine production, this test is predicated on both geophysical and geological indications of a separate accumulation.

Northwest of here, at the center of sec. 19,11-19, Kern Line Oil Co. plugged it's 8390 ft. hole to 8150 ft. and at last report was testing the plug. The well is cased to 8200 ft. with a string of 6⅝ in. pipe.

A formation test of the interval 8180-8290 ft. recovered only muddy, brackish water and a trace of gas. While plans of the operator are not known, it is presumed that the well will be gun perforated and tested uphole.

Shafter Well Yet Troubled

Continental Oil Co.'s KCL No. C-2, sec. 35,27-24 in the Shafter area, still fights its persistent jinx.

Once bottomed at 11,349 ft., within striking distance of its chance at Vedder production, and after a series of fishing and redrilling jobs bringing the bottom back to 11,041 ft., the operators are again trying to loosen drill pipe stuck at 10,995 ft.

At last report circulating oil and acid had not succeeded in freeing the pipe.

Bankline Oil Plans New Maricopa Well

Abandoning well No. 24-24 at 4325 ft. in sec. 24,11-23, Bankline Oil Co. is planning its successor to be drilled in section 23.

Bottomed in Etchegoin gray sand, the first try encountered increasingly steep dips from the 2500 ft. mark.

McClung Wells Yet Drilling

Union Oil Co.'s KCL No. 31-3, Vedder test in sec. 3,30-26, is drilling ahead in shale at 11,308 ft.

Located on a southeast trend off the southerly tip of the Greeley field, the well should soon encounter the zone since it was found in previous adjacent drilling but little below 11,000 ft. and at 11,800 ft. a mile farther southeast.

Northeast of this well, Ohio Oil Co.'s KCL No. G-1, in sec. 36,29-26, is coring gray sand at 6593 ft.

Nothing but the gray stuff has been reported since 5193 ft. where a formation test of 13 ft. of sand recovered only salt water and a trace of gas.

Rig Built For Lost Hills Try

Tide Water Associated Oil Co. has built rig for Islais No. 1 in sec. 16,27-21 for a shot at production off the southerly tip of the Lost Hills field.

Sentinel Well Resumes Work

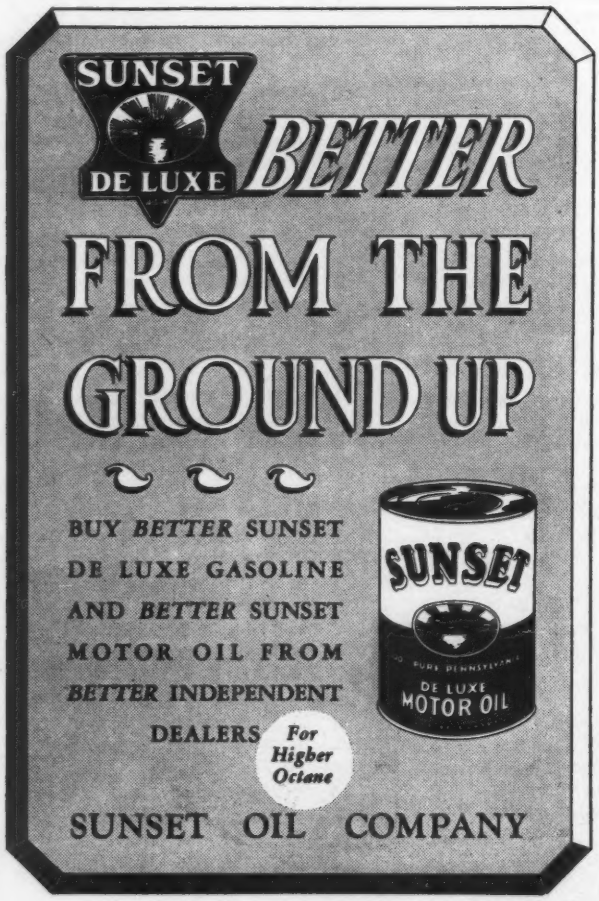
Sentinel Oil Co.'s well No. 1 in sec. 10,28-20 of the Belridge area is drilling at 1640 ft.

The try was started under the name Santa Mora Trust, which operator carried the well a little below 1300 ft.

Volume Increases in Union Avenue Well

The recent job of re-perforating done in Hancock Oil Co.'s Roberts No. 2 in the newly discovered Union Avenue pool at the southerly limits of Bakersfield, has greatly increased the well's production.

Originally finished pumping a little more than 115 bbls. and with capacity estimated at not more than 200 bbls., the well now pumps 410 bbls. of clean 15 gravity oil with ease from 5340 ft.



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Pyramid Hills Try Cores Cretaceous

Tide Water Associated Oil Co.'s West Slope No. 76 at Pyramid Hills is drilling in shale at 3640 ft. after coring the Cretaceous at 2375 ft.

Located in sec. 20,24-18 the well found gray sand with a slight oil odor in the base of the Eocene.

This is the fourth well drilled in the area since Tide Water found shallow 40 bbl. production in section 20 last year. Drilled to 2087 ft. the original well was plugged back to 950 ft. for the yet unduplicated production from the lower Miocene.

Pyramid Prod. Co. is rigging up to drill Spreckles No. 2 in sec. 16,24-18 of the area.

Terra Bella Well Nears Basement

G. W. Stout's well No. 1 in sec. 35, 22-27 of the Terra Bella area of Tulare county was last reported at 1113 ft. in hard formation encountered at 750 ft.

Located in a heavily drilled area it is known that basement granite is found relatively shallow over the entire area. In the northwest corner of the same section Sheppard and Assoc. found granite at 950 ft. while other nearby wells have found it just below 1100 ft.

Crestmont to Start Round Mountain Well

Acquiring from Shell Oil Co., Inc. all of the Olcese Estate One lease, expecting the portion surrounding presently producing wells, Crestmont Oil Co. will drill Olcese Estate No. 1-1 in the northeast quarter of sec. 16,28-29.

In the small pool of production shared with Crestmont, in sec. 8,28-29, Trico Oil & Gas Co. finished Coffee No. 7 from 1488 ft. for 178 bbl. of clean 17 gravity oil.

Buena Vista Try Nears 14,000 Ft.

Up in the Buena Vista Hills on sec. 10,32-24 Honolulu Oil Corp. is steadily surpassing its own world record for depth with an electric rig.

Last reported in hard brown shale with streaks of fine gray sand at 13,911 ft. the hole is showing steep dips.

Slight oil and gas showings have been reported at varying levels but nothing has been found to warrant stopping the drill to test.

Proposing to explore the area as deep as equipment would permit, the present depth has startled even the operators since the rig is of light construction designed for only moderate depth. And the tough going in this area makes the nearly 14,000 ft. hole far from moderate.

The high structural advantage of the well plus the drilled hole makes this the deepest penetration yet made in the Buena Vista area. To date it's exact position in the geologic column has not been determined since there is little against which to correlate.

T. T. Gill Handbook Now Off Press

A handbook entitled "Air and Gas Compression" has just been released by John Wiley and Sons, Inc., 440 Fourth Avenue, New York City. The author, T. T. Gill of the Gas Department of the Union Oil Company of California, is well known to members of the petroleum industry in California. The book consists of 177 pages of carefully prepared discussions, formulae, curves and charts of interest and value to natural gas and petroleum engineers. Considerable space is devoted to the subject of high pressure compression, deviation, effect thereof upon horsepowers, etc., a topic of considerable interest on account of existing interest in re-pressuring, gas storage, pressure maintenance and re-cycling. Price $3.00.

San Joaquin Valley Barbecue June 7th

The San Joaquin Valley Oil Men's Barbecue and Golf Tournament will be held June 7th, at the Stockdale Country Club, Bakersfield. Tickets are on sale at all Republic Supply Co. stores, and at the gate.

In charge are: Harry Taylor, Medearis Oilwell Supply Co., general chairman; Ed Meyers, Oilwell Supply Co., chairman beer committee; Roy Johnston, Republic Supply Co., ticket chairman; Otto Lamb, D & M Machine Works, chairman food committee; Tex Little, Crum-Brainard Co., chairman entertainment committee; Tommy Cullen, chairman, prize committee and D. D. Long and Red Radke, Hughes Tool Co., in charge of golf tournament.

Conservation Officers For 1941-2 Appointed

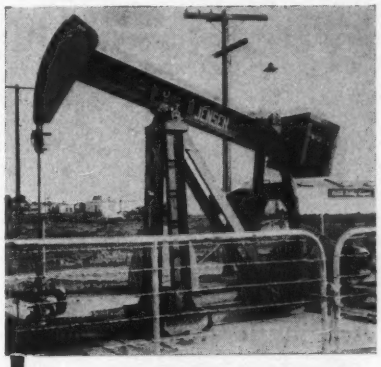
Officers and sub-committee members for the Conservation Committee of California Oil Producers for 1941-1942 have been nominated by the committee appointed for that purpose by the Conservation Committee chairman, A. H. Bell.

The nominees to be voted upon at the next meeting of the Conservation Committee on May 22 follow:

Conservation Committee Chairman—A. H. Bell, Continental Oil Co.; First Vice-chairman, Lloyd Williamson, California Star Oil Co.; Second Vice-chairman, Richard Fenton, California Stripper Well Assn.; Secretary, William L. Hobro, Shell Oil Co., Inc.

Administrative Committee Chairman; R. D. Montgomery, Richfield Oil Corp.; R. P. Huggins, Western Gulf Oil Co.; Wm. H. Morgan, R. R. Bush Oil Co.; R. I. Brown, Standard Oil Co. and F. M. Zeigler, Kern Oil Co. Ltd.

Allocation Committee Chairman; W. C. Whaley, Barnsdall Oil Co.; E. H. McCollough, Amerada Petroelum Co.; H. S. Stark, Honolulu Oil Corp.; R. R. Boyd, Richfield Oil Corp.; Max App, General Petroleum Corp.; Joseph Jensen, Tide Water Associated Oil Co. and L. L. Aubert, Bankline Oil Co.



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Coastal District

Elwood Wildcat Nearing Vaqueros

The Texas Co.'s latest wildcat at Elwood, Bishop No. A-3, is drilling below 2500 ft. and nearing the Vaqueros formation. The objective sand was picked up in two previous tests at approximately 3000 ft. but was barren of oil and gas. The wells are located near the intersection of the State Highway and Glenn Annie Road north of the Elwood field.

On Tideland Permit No. 88, Barnsdall Oil Co. is drilling No. 11 and has derrick erected for No. 12, both within old productive limits.

Trans-Pacific Tests Old Goleta Project

Trans-Pacific Oil Co. is testing for production in the old Hollister No. 2-A well at Goleta which was originally drilled by Santa Barbara Oil Co. and late last year taken over by Spencer D. Coates. Located in sec. 3,4-29, the hole is 1573 ft. deep with 8¼ in. casing cemented at 1543 ft.

Ventura County Activity Reported

With the assurance of good weather for the next five or six months, operators are going ahead with Ventura county development plans. In sec. 5,3-19, between Bardsdale and Shiells Canyon, James W. Bell of Los Angeles is planning to drill on Elkins property. Palma Oil Co. is spudding its test well in sec. 8 of the same township, while in sec. 1, Hopland Oil Co. is drilling below 1850 ft. In the old Bardsdale field, F. E. Fairfield is testing his No. 1 with bottom at 3470 ft.

North of Santa Paula, in sec. 12,4-22, Oil Production Maintenance, Inc. is preparing to deepen from 395 ft. after cementing 13⅜ in. casing at that depth. Northeast of Piru, Glen Ogles Oil Co. Janes No. 1 is sidetracking a string of collapsed 6⅝ in. casing. Total depth is 2863 ft.

Now drilling steadily, Inter-Counties Fuel Co. is making hole below 870 ft. The well is located near the mouth of Sespe Creek.

Temulac Oil Spuds Shiells Canyon Well

In a revival of activity at Shiells Canyon, two new wells are drilling and an old well is being reconditioned. Temulac Oil Co. was the first to get under way with the new drilling but was only a few days ahead of O. C. Field Gasoline Co.'s Calumet No. B-4. Both are still above 2500 ft. J. W. (Blondie) Elder is cleaning out the old Calumet No. 14 which is bottomed at 2757 ft.

Fifteen Strings Busy on Avenue

Fifteen strings of tools are now working in Ventura Avenue which for the past fifteen years has been one of the most consistently active fields in California. General Petroleum Corp., responsible for the re-opening of the Avenue area three years ago, is spudding in Barnard No. 20. Alliance Petroleum Corp., British-American Oil Producing Co. and Bolsa Chica Oil Co. each have a driller in the same general area.

In the east and northeast sections, Lloyd Corp. and Tide Water Associated Oil Co. have sizable development programs while Shell Oil Co. is active at the west end.

Rincon Deep Test Continues Drilling

Chanslor-Canfield Midway Oil Co. is still exploring ahead in Hobson No. C-9 which is far and away the deepest hole yet drilled in the Rincon field. Because of the exploratory nature of this well, no great amount of information is available beyond that sufficient oil sand has been cored below established zones to guarantee some kind of production. Officials of the company are reticent in expressing definite opinions but are confident a good well will be obtained in the interval below the shoe of the 8⅝ in. casing at 7539 ft. When last reported bottom was 9135 ft. in fractured brown shale streaked with oil sand.

Only other active operator at Rincon is Richfield Oil Corp. which is drilling Hobson-U. S. No. 3 at approximately 2500 ft.

Few Changes In Conservation Group

With the exception of two new field committee chairmen who will be new members and five new field committee vice-chairmen who will be new alternate members, the 1941-1942 Conservation Committee of California Oil Producers will be made up of the same men as the 1940-1941 committee. Tabulation of the results of the recent balloting by operators is now being mailed to each operator.

The two new field committee chairmen who will become new members of the Conservation Committee at its organization meeting on May 22 are Dana Hogan, representing Mountain View and other fields in that area, and J. L. Stephens, representing the Mt. Poso district. Emil Kluth, newly elected chairman of the Santa Fe Springs field committee, has been on the Conservation Committee as representative at large for the San Joaquin Valley.

COASTAL COUNTIES WILDCATS

Area	Well	No.	Section	Depth	Status
Santa Barbara County					
Elwood	The Texas Co., Bishop	A-3	13, 4-29	1741	Drilling
Goleta	Del Mar Oil Co., Rowe	1	11, 4-28	130	Idle
	Trans-Pacific Oil & Drlg. Co., Hollister	2-A	3, 4-29	1573	Rng. tubing
San Luis Obispo County					
Huasna	Tex Harvey Oil Corp., Gilmore Comm.	1	11, 32-14	4518	No report
	Tex Harvey Oil Corp., Gilmore Comm.	2	11, 32-14	2200	Idle
Paso Robles	Epco, Inc., Epco	1	27, 26-13	6157	Idle
Ventura County					
Bardsdale	Hopland Oil Co.	1	1, 3-19	1811	Drilling
	Fairfield, F. E., Fairfield-Filmore	1	12, 3-20	3470	Drilling
	Palma Oil Co.	1	8, 3-19		Prep. to spud
Ojai	Oil Prod. Maintenance, Inc. Byhara	1	12, 4-22	395	Drilling
Piru	Nelson, D. V., P.F.C.—C.H.	1	19, 4-18	1690	Idle
	Glen Ogles Oil Co., Janes	1	16, 5-18	2863	Sidetracking
	Havlin & Pottenger, Alice	1	33, 4-8	1715	Idle
Santa Susana	Norell, Gordon, Dixie	1	15, 2-17		Grade
Sespe	Chob Oil Co., Phillips	1	24, 4-20	75	Drilling
	Inter Counties Fuel Co.	1A	22, 4-19	837	Drilling
	McCaslin, W. E.. Burson	1	19, 4-19	2050	Idle
	Signal Petroleum Co., Hadley	7	13, 4-19	3576	Drilling
South Mountain	Comstock Pet. Co.	1	17, 3-29	1800	Prep. to resume
	South Mountain Oil Co.	1	10, 3-20	2771	Testing
Timber Canyon	Crude Oils, Inc., West	1	10, 4-20	345	Drilling
	Fletcher, A. B., Timber Canyon	3	18, 4-20	1360	Idle
	Johnson, Chas. P., Jr.	1	24, 4-21	110	Idle

Adding its fourth Wilson well servicing unit just recently, Oil Well Service Co., 2405 Orange Ave., Long Beach, is giving indications of becoming one of the fatest growing service organizations in the territory. This latest type unit, shown at left on a Wilmington field well, is a Wilson double drum Winchmobile with single telescoping mast designed to service wells without derricks. Above is another of the company's Wilson units doing a record job at Royalty Service Corp.'s Riverside No. 1, Rosecrans. At this well the crew pulled 92 stands of 3-in. external upset tubing and one stand of 2½-in. external upset on bottom, all pulled wet. Depth of the well is 8736 ft., believed to be one of the deepest rod pumping wells in California. Note the blowout preventer and special safety equipment made necessary by this well flowing during the pulling job.

Fire Protection Engineers Form Partnership

Meeting the need of industry for an adequate fire protection planning and consulting service, Daugherty & Howell, two of the West Coast's best known protection engineers have just announced the formation of a partnership, with headquarters at 606 South Hill St., Los Angeles.

The partners have the full endorsement and support of the nation's leading fire protection organizations and authorities, among them National Board of Fire Underwriters, Underwriter's Laboratories Inc., National Safety Council, National Fire Protection Association, and the American Petroleum Institute.

Frank R. Daugherty acquired his technical background at University of California, whence he emerged in 1922 to accept a position as safety and research engineer for the California Compensation Bureau. He was 4 years with the Board of Fire Underwriters, developing special hazard rating schedules, and studying all the aspects of hazards and risks in a wide diversity of industries. For 12 years he was Southern California manager for Seeley & Co., representing a large group of insurance organizations.

John T. Howell, civil engineer and former fire protection head for Union Oil Co. of Calif., is a nationally-known authority and speaker on fire prevention and control. He is a member of the American Petroleum Institute Fire Committee, National Fire Protection Association, International Association of Fire Chiefs, and has been identified with scientific methods of industrial protection for over 20 years. He is at the present time a member of the faculty of University of Southern California School of Government, instructing in fire prevention and control.

Merchrome Coated Valves For Mud Lines Developed

Revealing amazing performance records of Hypreseal valves in mud line service, a Bulletin featuring Nordstrom Merchrome Coated Valves has been issued by Merco Nordstrom Valve Co.

Actual unretouched photos are presented of valves removed for inspection after use in drilling for long periods of time. One of the valves was used on a bleeder line for more than eight months in connection with drilling over 100,000 feet of hole. The surfaces of the Merchromed plug and the interior of the body show practically no wear nor any sign of channeling.

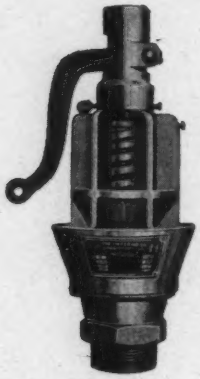
This new Bulletin describes the Merchrome coating process and its application to mud line service. Sizes are listed, 2", 3", and 4", with tables of specifications covering dimensions, pressure ratings, and new numbers to be given to these valves. For ready identification, all Merchrome coated valves are to be painted with bands of distinctive color at the fillet of the flanges and each valve will carry a boss plate with the letters MM on same.

The Merchrome process is an exclusive patented development whereby the plugs and interior of bodies of Nordstrom Valves are hard faced to prevent corrosion and erosion.

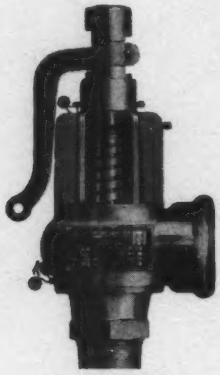
The new Bulletin, No. V-136, gives full details. A copy may be obtained by writing to Merco Nordstrom Valve Co., 400 Lexington Ave., Pittsburgh, Pa.

New Inferno Safety "Pop" Valves Feature High Relieving Capacities

Here are five new styles of Safety "Pop" Valves that have relieving capacities 280% greater than the ASME Code requirements, according to the Inferno Co. engineers. The ASME Code requires a relieving capacity in Safety Valves based on a generating capacity of only eight pounds of steam per hour per square foot of heating surface in the boiler. The manufacturer of this Valve maintains a testing boiler plant closely simulating oil field boiler units and has made many tests of the steam generating capacity of boilers. These tests disclose a generating capacity of almost fifteen pounds. This manufacturer, therefore, considers it good practice to give his Safety Valves a positive relieving capacity greater than the steam generating capacity of any oil field boiler thus far perfected, and 280% of the minimum Code requirements.

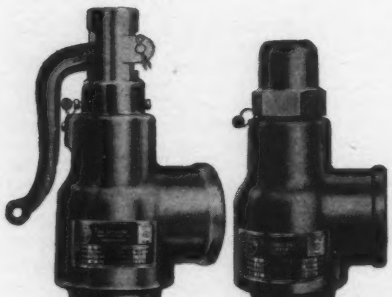


No. HC-TOES-A (High Capacity—Top Outlet Exposed Spring)



No. HC-SOES (High Capacity—Side Outlet Exposed Spring)

No. HC-TOCS (High Capacity—Top Outlet Closed Spring)



No. HC-SOCS (High Capacity—Side Outlet Closed Spring)

No. HC-SOCS-CS (High Capacity—Side Outlet Closed Spring Capped and Sealed)

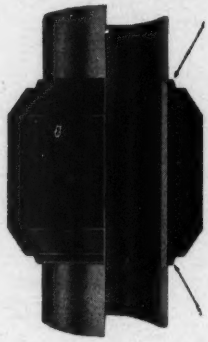
The five different styles shown are made to meet the needs and preferences of any customer. The Top Outlet Exposed Spring Valve (Style No. HC-TOES-A) has a Cone Deflector that diffuses the steam upward but away from the spring. The Side Outlet Exposed Spring Valve (Style No. HC-SOES) is the newest design, the spring being left exposed for inspection. All back pressure is eliminated, even when the steam must be piped away. Style No. HC-TOCS is a Top Outlet Valve with the spring enclosed. The Side Outlet Closed Spring Valve (Style No. HC-SOCS) is used where steam must be piped away. The fifth style Valve has a Side Outlet Enclosed Spring, is Capped and Sealed, and is generally used as a Relief Valve.

All of these High Capacity Valves are set for the minimum Blow-Down designated by the ASME Code so that no steam is wasted. A lever and convenient pull cord is provided to encourage frequent tests. The Valves have Stainless Steel Stems impervious to corrosion, tough malleable iron bodies with tensile strength from 55,000 to 60,000 pounds per square inch, Nickel Alloy Valves and Seats which resists rust and is harder than bronze, and Chrome Vanadium Cadmium Plated Springs which weakens more slowly than springs made from any other material known to metallurgical science. All are recommended for steam to 350 pounds, 450°F., or for Oil, Water and Gas to 1,000 pounds.

The maunfacturer has just published a new Bulletin (No. 11-C) which describes and pictures these High Capacity Safety "Pop" Valves. The INFERNO Company, Dept. COWP, Shreveport, Louisiana.

New Special Lip Protector

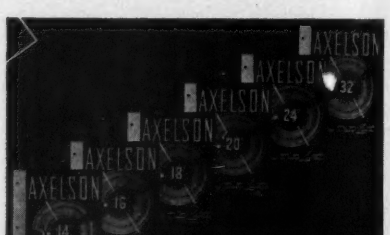
Under certain well conditions the drill pipe may become "ringed" or grooved immediately above or below the commonly used drill pipe rubber protectors. These grooves do not exceed ¼ inch in width. The "ringing" is caused by either a mechanical or chemical action which scours away some of the metal and has a tendency to weaken the pipe. A new special lip protector has been developed by Patterson-Ballagh Corp. to prevent this action. An extended lip is molded as an integral part of the rubber protector at the top and bottom inner periphery. This lip prevents any action from taking place at the inner edge of the protector. It gives the protector more streamlining. In wells where scouring occurs, this new type of rubber protector solves the problem, according to the manufacturer. The lip forms a sealing ring which prevents mud from getting behind the protector.



The extension of the lip at both ends of the protector adds approximately 15% more contact area and gives more grip to the pipe. Further details may be obtained from the manufacturer, Patterson-Ballagh Corporation, 1900 East 65th Street, Los Angeles, Calif.

Axelson Issues Six New Bulletins

Six new bulletins describing in detail various sizes of Axelson Heavy-duty 24-Speed Geared Head Lathes are now ready for distribution. Copies can be obtained by writing the Axelson Manufacturing Co., Box 98, Vernon Station, Los Angeles, Calif., Department A.



In these new bulletins both front and rear views of each size lathe are shown in large-scale illustrations. A detailed general description as well as itemized specifications are also furnished.

The bulletin format has been worked out so that each separate bulletin can be added to your present engineering file of lathe data.

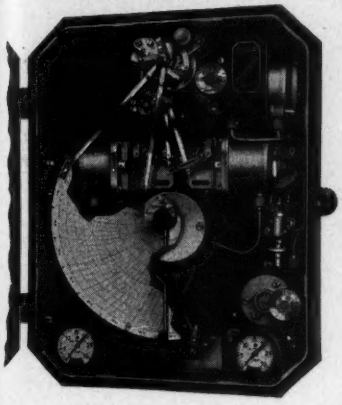
Cliff Baker Resumes Inglewood Wildcat

Cliff Baker has resumed drilling his wildcat well, L.A.I. No. 1, located northwest of the city of Inglewood. Present depth is reported below 3000 ft.

New oil fields have been discovered in the Eldjesira region of northern Syria near Turkey.

Simple, Direct-Set Ratio Controller

A highly adaptable, easily convertible instrument for applications where a temperature, pressure, rate of flow or liquid level must be controlled in a desired



ratio or differential to another related variable is now offered by the Taylor Instrument Co., of Rochester, N.Y.

With the new direct-setting Taylor Ratio Controller the ratio is changed by a simple screwdriver adjustment directly on a calibrated dial throughout the range of 0:1 to 3:1, direct or inverse. With this new instrument it is unnecessary to disturb the processing or remove the chart plate part while making ratio adjustments.

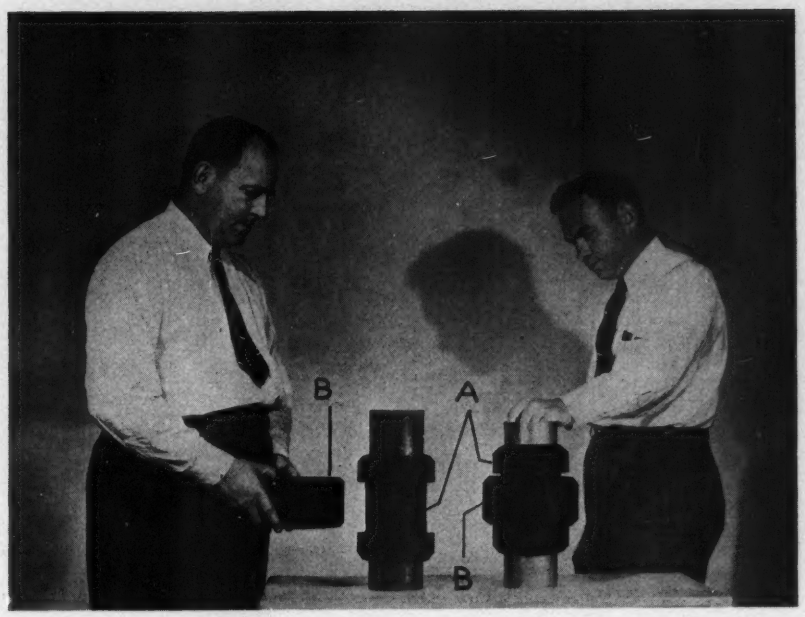
The Taylor Ratio Controller has two measuring systems one the adjusting system which indicates or records only; and the other, the controlling system, which may either indicate or record. The adjusting system resets the control point of the controlling system through a linkage arrangement according to a predetermined ratio. The action of the controlling system is the same as the 120R Series Fulscopes and may be used as a single duty bi-recording controller when the ratio setting is zero.

Both indicating and recording models of the Ratio Controller are available with all the features of the 120R Series Fulscope—Fixed High Sensitivity, Adjustable Sensitivity, Adjustable Sensitivity with Automatic Reset, Adjustable Sensitivity with Pre-Act, and Adjustable Sensitivity with Automatic Reset and Pre-Act. Write for Bulletin No. 98158.

E. M. Smith Co. Offers New Drill Pipe Bearing

The Grizzly "Hug-Tite" Drill Pipe Bearing, for casing and open hole drilling, is a new product recently announced by E. M. Smith Co. of Los Angeles, California.

Shown here with the inventor, Walter Smith, general manager of the above company, this product is made entirely of rubber of special formula and consists of two parts, (See Fig. 1): (a) the "Hug-Tite" Base, made in one solid piece and shaped like a spool, with flanges at each end; and (b) the free-spinning "Hug-Tite" Bearing that fits over the base between the flanges as shown in Fig. 2. The clearance between the Bearing and the Base, both radially and endwise, is such as to permit the Bearing to turn freely without friction; and is lubricated by the mud circulating in the hole which creates an extremely smooth, slippery surface, eliminating practically all friction and wear on these parts.



Walter Smith, inventor, left, demonstrating where Grizzly "Hug-Tite" Bearing fits on Base installed on drill pipe.

In service, when the Bearing (b) comes in contact with the formation or casing it stops turning, while the drill pipe and Base (a) continue to rotate; thus actually functioning as a positive roller bearing, eliminating torque and stress on the pipe, completely stabilizing the entire drilling string. As the drill pipe is protected against all contact with the formation or casing by the oversize Bearing, the drill pipe, tool joints and casing are completely protected at all times and wear on these parts is reduced to minimum. The rubber to rubber contact between the Bearing and Base; together with the free-spinning, mud-lubricated clearance between these parts; enables the Bearing to withstand any contact with the formation or casing with little or no wear.

In order to obtain complete stabilization, it is stated that a Grizzly Bearing should be installed on every other single throughout the full length of the drilling string. This in turn enables faster rotation and more weight on the bit without torque or strain; with less danger of twist-offs; reduced wear and tear on machinery; less fuel consumption; and higher efficiencies and economies in drilling operations.

Both the Bearing and Base of this device are hydraulically installed by unique and especially designed equipment manufactured and operated by E. M. Smith Company. This method, according to the makers, permits a much tighter grip on the pipe than is possible by other methods, as well as the use of a far stronger and tougher rubber in the manufacture of the product; both contributing to better protection and longer wear.

Grizzly "Hug-Tite" Drill Pipe Bearings, Protectors and Stabilizers, and installation equipment are fully covered by patent applications. Detailed information may be obtained by writing direct to the manufacturer for Bulletin No. 22 OF.

Conservation Elections

The five field committee vice-chairmen who will be new alternate members of the Conservation Committee are W. A. Clark, Buena Vista district; H. A. Brett, Dominguez; Chester F. Dolley, Torrance-Hermosa; D. D. Dunlap, Wilmington-Long Beach and Terminal areas; R. H. Thompson, Wilmington Townlot area. The Conservation Committee is made up of the chairmen and vice-chairmen of field committees of the 29 oil producing districts of the state, who are elected by the operators in the individual fields, together with "at-large" members who are elected by the Conservation Committee itself at its organization meeting.

In addition to electing the at-large members, the committee will also hold its annual election of officers, a chairman, two vice-chairmen, and a secretary, together with the chairmen and members of the Allocation and Administrative sub-committees. A. H. Bell, retiring chairman of the Conservation Committee, has appointed L. L. Aubert chairman, R. P. Huggins, W. H. Geis, Harold Wyatt, and F. M. Zeigler members of a nominating committee to prepare a list of nominations for officers and sub-committee members.

Business and Professional Directory

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Oil Men's Calendar

Calif. Natural Gasoline Association. Los Angeles Chapter—Meets 1st Thursday Each Month, Barker Bros. Bldg., Los Angeles—Dinner at 6:00 (Optional). Taft Chapter—Meets Third Thursday Each Month.

American Society of Mechanical Engineers—Los Angeles Section—Meets 2nd Thursday Each Month—Barker Bros. Bldg., Los Angeles. Dinner at 6:30 (Optional).

May

29-31—National Oil Scouts & Landmen's Assn., Adolphus Hotel, Dallas, Tex.

June

1-6—Society of Automotive Engineers, Summer Meeting, The Greenbrier, White Sulphur Springs, W. Va.

9-10—Liquefied Petroleum Gas Assn., Inc., Pacific Coast Section, Fairmont Hotel, San Francisco, Calif.

23-27—American Society for Testing Materials, 44th Annual Meeting, Palmer House, Chicago, Ill.

September

8-12—American Chemical Society, Chalfonte-Haddon Hall, Atlantic City, N. J.

17-19—National Petroleum Assn., 39th Annual Meeting, Hotel Traymore, Atlantic City.

25-26—Society of Automotive Engineers, National Tractor Meeting, Schroeder Hotel, Milwaukee, Wisc.

29-30—National Lubricating Grease Institute, Ninth Annual Meeting, Stevens Hotel, Chicago, Ill.

Engineering, Technology, latest news—twice a month in California Oil World.

H. G. Spengler, left, and L. A. Collenbaugh, holders of nearby acreage, were looking with interest at Smith No. 1 (Federal) on production in Inglewood field.